



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

~~Sci 320.5~~



PR 2208



Harvard College Library

FROM

the
Bureau of Navigation

21 Sept. 1888

SCIENCE CENTER LIBRARY



THE

136. 117

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1891.

FIRST EDITION.

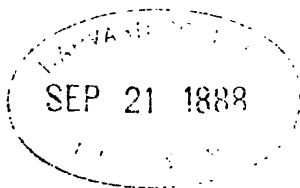
PUBLISHED IN COMPLIANCE WITH A JOINT RESOLUTION OF THE FORTY-SIXTH CONGRESS.

WASHINGTON:
BUREAU OF NAVIGATION.
1888.

130.5

Sci 320.5

pp. 2208



The Bureau of Navigation

JOINT RESOLUTION

FOR PRINTING THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That there shall be printed annually at the Government Printing Office fifteen hundred copies of the American Ephemeris and Nautical Almanac and of the papers supplementary thereto, of which one hundred shall be for the use of the Senate, four hundred for the House of Representatives, and one thousand for the public service, to be distributed by the Navy Department.

Sec. 2 That additional copies of the Ephemeris and of the Nautical Almanac extracted therefrom may be ordered by the Secretary of the Navy for sale: Provided, That all moneys received from such sale shall be deposited in the Treasury to the credit of the appropriation for public printing.

Approved, February 11, 1880

PREFACE.

THE arrangement of *The American Ephemeris* adopted in the volume for the year 1882, and explained in the Appendix to that volume, has been continued without radical change to the present time.

The additions then made comprise more complete data for eclipses of the sun, diagrams showing the configurations of the satellites of Jupiter, data respecting the disks of Mercury and Venus for the reduction of meridian and photometric observations, and diagrams, with tables, for identifying any known satellites of other planets. The work is divided into three parts, as follows:—

Part I, *Ephemeris for the Meridian of Greenwich*, gives the heliocentric and geocentric positions of the major planets, the Ephemeris of the Sun, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, gives the ephemerides of the fixed stars, sun, moon, and major planets for transit over the meridian of Washington. The mean places of the fixed stars and the data for their reduction are also included in this Part. The list of mean and apparent places of fixed stars has been greatly enlarged, for the convenience of field-astronomers.

Part III, *Phenomena*, contains predictions of phenomena to be observed, with data for their computation. Washington mean time is used in this part except in a few cases, notably that of eclipses, where Greenwich mean time was judged more convenient.

SIMON NEWCOMB,

Professor U. S. Navy, Superintendent.

WASHINGTON, June, 1888.

CONTENTS.

| | |
|---|------------|
| Corrections | Page vi |
| Chronological Eras and Cycles | vii |
| Symbols and Abbreviations | viii |

PART I—EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

| | |
|---------------------------------|------------------------|
| | Pages of Each Month |
| Ephemeris of the Sun | I—III |
| Ephemeris of the Moon | IV—XII |
| Phases of the Moon | XII |
| Lunar Distances | XIII—XVIII |

| | |
|--|------|
| | Page |
| Geocentric Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune | 218 |
| Heliocentric Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune | 250 |
| Sun's Co-ordinates | 264 |
| Moon's Longitude and Latitude | 272 |
| Moon's Equator and Libration | 276 |
| Obliquity of the Ecliptic, Equation of Equinoxes, Precession, etc. | 278 |

PART II—EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

| | |
|---|-----|
| BRASSL's Formulae for Star-Reductions | 280 |
| Besselian Star-Numbers, <i>A, B, C, D</i> | 281 |
| Independent Star-Numbers, <i>f, g, h</i> , etc. | 285 |
| Mean Places of Standard Stars for 1891.0 | 293 |
| Apparent Places of Four Circumpolar Stars | 302 |
| Apparent Places of Other Standard Stars | 314 |
| Apparent Right Ascensions of Additional Stars | 365 |
| Ephemeris of the Sun | 377 |
| Moon-Culminations | 385 |
| Transit-Ephemerides of the Planets Mercury, Venus, Jupiter, Saturn, Uranus, Neptune | 393 |

PART III—PHENOMENA.

| | |
|--|-----|
| Eclipses | 410 |
| Moon's Phases, Apogee, Perigee, and Greatest Libration | 415 |
| Elements for the Prediction of Occultations | 416 |
| Occultations Visible at Washington | 442 |
| Downes's Table for Facilitating the Prediction of Occultations | 444 |
| Disk of Mercury | 446 |
| Disk of Venus | 447 |
| Disk of Mars | 448 |
| Satellites of Jupiter | 449 |
| Satellites of Saturn | 474 |
| Rings of Saturn | 477 |
| Satellites of Uranus | 478 |
| Satellite of Neptune | 479 |
| Phenomena, Planetary Constellations | 480 |
| Positions of Observatories | 482 |
| On the Arrangement and Use of <i>The American Ephemeris and Nautical Almanac</i> | 487 |

APPENDIX.

| | |
|--|-----|
| On the Construction of <i>The American Ephemeris and Nautical Almanac</i> for 1891 | 513 |
|--|-----|

TABLES.

| | |
|---|--|
| Table I.—Correction of Lunar Distances for Second Differences in Moon's Motion. | |
| Table II.—Reduction of Sidereal to Mean Solar Time. | |
| Table III.—Reduction of Mean Solar to Sidereal Time. | |
| Table IV.—Latitude by Observation of the Altitude of Polaris. | |

CORRECTIONS.

The American Nautical Almanac for 1888 (First Edition).

Page 248, Ann. Var. in Dec. of δ Orionis, for $-2'.93$ read $+2'.93$

Ephemeris for 1888 (First Edition only).

| | | |
|--|----------------|-----------------|
| Page 293, R. A. of 6 Ursæ Minoris, | for $20^s.008$ | read $20^s.080$ |
| 294, 47 Cephei (H.) Ann. Var. in R. A., | " $+7^s.5152$ | " $+7^s.7152$ |
| 297, β Chamæleonis, " " | " $+3^s.3706$ | " $+3^s.3996$ |
| 297, α Canum Venat., " " | " " | " $+2^s.8157$ |
| 298, 4 Ursæ Minoris, " " | " $-0^s.3349$ | " $-0^s.3249$ |
| 298, ρ Bootis, Ann. Var. in Dec., | " $-15''.695$ | " $-15''.965$ |
| 299, δ Ursæ Minoris, Dec., | " $20''.24$ | " $40''.24$ |
| 300, θ Lyre, R. A., | " $30^s.791$ | " $28^s.791$ |
| 302 to 312, To the R. A. of α Ursæ Minoris apply the correction $-0^s.04$ | | |
| 322, Dec. of ι Orionis, | for South | read North. |

Ephemeris for 1890.

Page 487, Dec. 31^d 2^d, for in Perihelion read \oplus in Perihelion.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1891, WHICH COMPRISES THE LATTER PART OF THE 115TH AND THE BEGINNING OF THE 116TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6604 of the Julian Period;

- " 7399-7400 of the Byzantine era, the year 7400 commencing on September 1st;
- " 5651-52 of the Jewish era, the year 5652 commencing on October 3d, or, more exactly, at sunset on October 2d;
- " 2644 since the foundation of Rome, according to VARRO;
- " 2638 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period: corresponding, in the notation of chronologists, to the 747th; and, in the notation of astronomers, to the 746th year before the birth of CHRIST;
- " 2667 of the Olympiads, or the third year of the 667th Olympiad commencing in July, 1891, if we fix the era of the Olympiads at 775½ years before CHRIST, or near the beginning of July of the year 3938 of the Julian Period;
- " 2203 of the Grecian era, or the era of the Seleucidæ;
- " 1607 of the era of DIOCLETIAN;
- " 2551 of the Japanese era and to the 24th year of the period entitled "Meiji."

The year 1309 of the Mohammedan era, or the era of the Hegira, begins on the 7th day of August, 1891.

The first day of January of the year 1891 is the 2,411,734th day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

| | | | |
|--------------------------------------|----|---------------------------|------|
| Dominical Letter | D | Solar Cycle | 24 |
| Epact | 20 | Roman Indiction | 4 |
| Lunar Cycle or Golden Number | 11 | Julian Period | 6604 |

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

| | | |
|--|--|--|
| <p>☉ The Sun.</p> <p>☾ The Moon.</p> <p>☿ Mercury.</p> <p>♀ Venus.</p> <p>♁ The Earth.</p> | | <p>♂ Mars.</p> <p>♃ Jupiter.</p> <p>♄ Saturn.</p> <p>♅ Uranus.</p> <p>♆ Neptune.</p> |
|--|--|--|

SIGNS OF THE ZODIAC.

| | | |
|--|--|---|
| <p>Spring Signs. { 1. ♈ Aries.</p> <p style="margin-left: 1.5em;">2. ♉ Taurus.</p> <p style="margin-left: 1.5em;">3. ♊ Gemini.</p> <p>Summer Signs. { 4. ♋ Cancer.</p> <p style="margin-left: 1.5em;">5. ♌ Leo.</p> <p style="margin-left: 1.5em;">6. ♍ Virgo.</p> | | <p>Autumn Signs. { 7. ♎ Libra.</p> <p style="margin-left: 1.5em;">8. ♏ Scorpius.</p> <p style="margin-left: 1.5em;">9. ♐ Sagittarius.</p> <p>Winter Signs. { 10. ♑ Capricornus.</p> <p style="margin-left: 1.5em;">11. ♒ Aquarius.</p> <p style="margin-left: 1.5em;">12. ♓ Pisces.</p> |
|--|--|---|

ASPECTS.

- ♌ Conjunction, or having the same Longitude or Right Ascension.
- ☐ Quadrature, or differing 90° in Longitude or Right Ascension.
- ♌ Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

| | | |
|--|--|--|
| <p>♊ Ascending Node.</p> <p>♋ Descending Node.</p> <p>N. North.</p> <p>S. South.</p> <p>E. East.</p> <p>W. West.</p> | | <p>° Degrees.</p> <p>' Minutes of Arc.</p> <p>" Seconds of Arc.</p> <p>^h Hours.</p> <p>^m Minutes of Time.</p> <p>^s Seconds of Time.</p> |
|--|--|--|

P A R T I .

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH.

AT GREENWICH APPARENT NOON.

| THE SUN'S | | | | | | | | | |
|------------------|-------------------|---|----------------------|---|----------------------|------------------------------------|--|--|----------------------|
| Day of the Week. | Day of the Month. | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | Semi- diameter. | Sidereal Time of Semi- diameter Passing Meridian. | Equation of Time, to be Added to Apparent Time. | Diff. for 1 Hour. |
| Thur. | 1 | ^h 18 ^m 47 ^s 9.38 | ^s 11.041 | S. [°] 23 ['] 0 [″] 40.2 | +12.44 | ['] 16 [″] 18.41 | ^s 71.09 | ^m 3 ^s 44.85 | ^s 1.181 |
| Frid. | 2 | 18 51 34.20 | 11.027 | 22 55 27.9 | 13.58 | 16 18.41 | 71.04 | 4 13.03 | 1.167 |
| Sat. | 3 | 18 55 58.71 | 11.013 | 22 49 48.2 | 14.72 | 16 18.40 | 70.99 | 4 40.90 | 1.153 |
| SUN. | 4 | 19 0 22.85 | 10.997 | 22 43 41.3 | +15.85 | 16 18.38 | 70.94 | 5 8.41 | 1.137 |
| Mon. | 5 | 19 4 46.59 | 10.980 | 22 37 7.3 | 16.97 | 16 18.36 | 70.88 | 5 35.51 | 1.120 |
| Tues. | 6 | 19 9 9.89 | 10.962 | 22 30 6.5 | 18.09 | 16 18.33 | 70.82 | 6 2 18 | 1.102 |
| Wed. | 7 | 19 13 32.74 | 10.943 | 22 22 39.0 | +19.20 | 16 18.30 | 70.75 | 6 28.40 | 1.083 |
| Thur. | 8 | 19 17 55.10 | 10.922 | 22 14 45.0 | 20.30 | 16 18.27 | 70.68 | 6 54.14 | 1.062 |
| Frid. | 9 | 19 22 16.94 | 10.900 | 22 6 24.8 | 21.38 | 16 18.23 | 70.61 | 7 19.35 | 1.040 |
| Sat. | 10 | 19 26 38.24 | 10.876 | 21 57 38.6 | +22.46 | 16 18.19 | 70.53 | 7 44.03 | 1.016 |
| SUN. | 11 | 19 30 58.97 | 10.851 | 21 48 26.6 | 23.52 | 16 18.15 | 70.45 | 8 8.13 | 0.991 |
| Mon. | 12 | 19 35 19.09 | 10.825 | 21 38 49.1 | 24.58 | 16 18.10 | 70.37 | 8 31.63 | 0.965 |
| Tues. | 13 | 19 39 38.58 | 10.798 | 21 28 46.5 | +25.62 | 16 18.05 | 70.28 | 8 54.50 | 0.939 |
| Wed. | 14 | 19 43 57.41 | 10.771 | 21 18 19.0 | 26.65 | 16 17.99 | 70.19 | 9 16.71 | 0.911 |
| Thur. | 15 | 19 48 15.57 | 10.742 | 21 7 26.9 | 27.66 | 16 17.93 | 70.10 | 9 38.26 | 0.882 |
| Frid. | 16 | 19 52 33.03 | 10.711 | 20 56 10.6 | +28.67 | 16 17.86 | 70.01 | 9 59.10 | 0.852 |
| Sat. | 17 | 19 56 49.76 | 10.680 | 20 44 30.3 | 29.66 | 16 17.79 | 69.91 | 10 19.23 | 0.821 |
| SUN. | 18 | 20 1 5.76 | 10.649 | 20 32 26.5 | 30.64 | 16 17.71 | 69.81 | 10 38.62 | 0.790 |
| Mon. | 19 | 20 5 21.02 | 10.618 | 20 19 59.4 | +31.60 | 16 17.63 | 69.71 | 10 57.27 | 0.759 |
| Tues. | 20 | 20 9 35.52 | 10.586 | 20 7 9.4 | 32.55 | 16 17.55 | 69.61 | 11 15.16 | 0.727 |
| Wed. | 21 | 20 13 49.24 | 10.554 | 19 53 56.8 | 33.48 | 16 17.46 | 69.51 | 11 32.28 | 0.695 |
| Thur. | 22 | 20 18 2.18 | 10.522 | 19 40 22.1 | +34.40 | 16 17.36 | 69.40 | 11 48.62 | 0.663 |
| Frid. | 23 | 20 22 14.33 | 10.490 | 19 26 25.6 | 35.30 | 16 17.26 | 69.29 | 12 4.16 | 0.631 |
| Sat. | 24 | 20 26 25.68 | 10.457 | 19 12 7.6 | 36.19 | 16 17.15 | 69.18 | 12 18.91 | 0.598 |
| SUN. | 25 | 20 30 36.23 | 10.423 | 18 57 28.4 | +37.06 | 16 17.04 | 69.07 | 12 32.87 | 0.565 |
| Mon. | 26 | 20 34 45.98 | 10.390 | 18 42 28.5 | 37.91 | 16 16.92 | 68.96 | 12 46.03 | 0.532 |
| Tues. | 27 | 20 38 54.94 | 10.357 | 18 27 8.2 | 38.75 | 16 16.79 | 68.85 | 12 58.39 | 0.499 |
| Wed. | 28 | 20 43 3.09 | 10.323 | 18 11 28.0 | +39.58 | 16 16.66 | 68.73 | 13 9.95 | 0.465 |
| Thur. | 29 | 20 47 10.43 | 10.290 | 17 55 28.2 | 40.39 | 16 16.52 | 68.62 | 13 20.71 | 0.432 |
| Frid. | 30 | 20 51 16.97 | 10.256 | 17 39 9.1 | 41.19 | 16 16.38 | 68.50 | 13 30.67 | 0.398 |
| Sat. | 31 | 20 55 22.70 | 10.223 | 17 22 31.2 | 41.97 | 16 16.23 | 68.39 | 13 39.82 | 0.365 |
| SUN. | 32 | 20 59 27.63 | 10.189 | S. 17 5 34.8 | +42.73 | 16 16.08 | 68.27 | 13 48.17 | 0.331 |

NOTE.—The mean time of semidiameter passing may be found by subtracting 0^h.19 from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

| Day of the Week | Day of the Month. | THE SUN'S | | | | Equation of Time, to be Subtracted from Mean Time. | Diff. for 1 Hour. | Sidereal Time, or Right Ascension of Mean Sun. |
|-----------------|-------------------|--|-------------------|--|-------------------|--|-------------------|--|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | | | |
| | | ^h ^m ^s | ^s | [°] ['] ["] | ["] | ^m ^s | ^s | ^h ^m ^s |
| Thur. | 1 | 18 47 8.69 | 11.037 | S. 23 0 40.9 | +12.43 | 3 44.77 | 1.181 | 18 43 23.92 |
| Frid. | 2 | 18 51 33.43 | 11.024 | 22 55 28.8 | 13.57 | 4 12.95 | 1.167 | 18 47 20.48 |
| Sat. | 3 | 18 55 57.85 | 11.010 | 22 49 49.4 | 14.71 | 4 40.81 | 1.153 | 18 51 17.04 |
| SUN. | 4 | 19 0 21.91 | 10.994 | 22 43 42.7 | +15.84 | 5 8.31 | 1.137 | 18 55 13.60 |
| Mon. | 5 | 19 4 45.57 | 10.977 | 22 37 9.0 | 16.96 | 5 35.41 | 1.120 | 18 59 10.16 |
| Tues. | 6 | 19 9 8.79 | 10.959 | 22 30 8.4 | 18.08 | 6 2.07 | 1.102 | 19 3 6.72 |
| Wed. | 7 | 19 13 31.56 | 10.940 | 22 22 41.1 | +19.19 | 6 28.29 | 1.083 | 19 7 3.27 |
| Thur. | 8 | 19 17 53.85 | 10.919 | 22 14 47.4 | 20.29 | 6 54.02 | 1.062 | 19 10 59.83 |
| Frid. | 9 | 19 22 15.62 | 10.897 | 22 6 27.4 | 21.37 | 7 19.23 | 1.040 | 19 14 56.39 |
| Sat. | 10 | 19 26 36.85 | 10.873 | 21 57 41.5 | +22.45 | 7 43.90 | 1.016 | 19 18 52.95 |
| SUN. | 11 | 19 30 57.51 | 10.848 | 21 46 29.8 | 23.51 | 8 8.00 | 0.991 | 19 22 49.50 |
| Mon. | 12 | 19 35 17.56 | 10.822 | 21 38 52.6 | 24.57 | 8 31.50 | 0.965 | 19 26 46.06 |
| Tues. | 13 | 19 39 36.98 | 10.796 | 21 28 50.3 | +25.61 | 8 54.36 | 0.939 | 19 30 42.62 |
| Wed. | 14 | 19 43 55.75 | 10.768 | 21 18 23.1 | 26.64 | 9 16.57 | 0.911 | 19 34 39.18 |
| Thur. | 15 | 19 48 13.85 | 10.739 | 21 7 31.4 | 27.65 | 9 38.12 | 0.882 | 19 38 35.73 |
| Frid. | 16 | 19 52 31.25 | 10.709 | 20 56 15.4 | +28.66 | 9 58.96 | 0.852 | 19 42 32.29 |
| Sat. | 17 | 19 56 47.93 | 10.678 | 20 44 35.4 | 29.65 | 10 19.09 | 0.821 | 19 46 28.84 |
| SUN. | 18 | 20 1 3.88 | 10.647 | 20 32 31.9 | 30.63 | 10 38.48 | 0.790 | 19 50 25.40 |
| Mon. | 19 | 20 5 19.09 | 10.616 | 20 20 5.1 | +31.59 | 10 57.13 | 0.759 | 19 54 21.96 |
| Tues. | 20 | 20 9 33.54 | 10.584 | 20 7 15.4 | 32.54 | 11 15.02 | 0.727 | 19 58 18.52 |
| Wed. | 21 | 20 13 47.22 | 10.552 | 19 54 3.2 | 33.47 | 11 32.14 | 0.695 | 20 2 15.08 |
| Thur. | 22 | 20 18 0.12 | 10.520 | 19 40 28.8 | +34.39 | 11 48.48 | 0.663 | 20 6 11.64 |
| Frid. | 23 | 20 22 12.23 | 10.488 | 19 26 32.6 | 35.29 | 12 4.03 | 0.631 | 20 10 8.20 |
| Sat. | 24 | 20 26 23.54 | 10.455 | 19 12 14.9 | 36.18 | 12 18.79 | 0.598 | 20 14 4.75 |
| SUN. | 25 | 20 30 34.06 | 10.422 | 18 57 36.1 | +37.05 | 12 32.75 | 0.565 | 20 18 1.31 |
| Mon. | 26 | 20 34 43.78 | 10.389 | 18 42 36.5 | 37.91 | 12 45.91 | 0.532 | 20 21 57.87 |
| Tues. | 27 | 20 38 52.71 | 10.356 | 18 27 16.6 | 38.74 | 12 58.28 | 0.499 | 20 25 54.43 |
| Wed. | 28 | 20 43 0.83 | 10.322 | 18 11 36.7 | +39.57 | 13 9.85 | 0.465 | 20 29 50.98 |
| Thur. | 29 | 20 47 8.15 | 10.289 | 17 55 37.2 | 40.38 | 13 20.62 | 0.432 | 20 33 47.53 |
| Frid. | 30 | 20 51 14.67 | 10.255 | 17 39 18.4 | 41.18 | 13 30.58 | 0.398 | 20 37 44.09 |
| Sat. | 31 | 20 55 20.38 | 10.222 | 17 22 40.7 | 41.95 | 13 39.74 | 0.365 | 20 41 40.64 |
| SUN. | 32 | 20 59 25.29 | 10.188 | S. 17 5 44.6 | +42.72 | 13 48.10 | 0.331 | 20 45 37.19 |

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,
+9.8565.
(Table III.)

| AT GREENWICH MEAN NOON. | | | | | | | | |
|--|------------------|-----------------|------------|-------------------|-----------|--|-------------------|---|
| Day of the Month. | Day of the Year. | THE SUN'S | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 Hour. | Mean Time of Sidereal Noon. |
| | | TRUE LONGITUDE. | | Diff. for 1 Hour. | LATITUDE. | | | |
| | | λ | λ' | | | | | |
| 1 | 1 | 280° 50' 32.3 | 50' 48.1 | 152.90 | + 0.50 | 9.9926508 | + 0.8 | ^h 5 ^m 15 ^s 44.21 |
| 2 | 2 | 281 51 41.9 | 51 57.5 | 152.91 | 0.47 | 9.9926538 | 1.8 | 5 11 48.30 |
| 3 | 3 | 282 52 51.8 | 53 7.2 | 152.92 | 0.40 | 9.9926591 | 2.7 | 5 7 52.39 |
| 4 | 4 | 283 54 1.9 | 54 17.1 | 152.93 | + 0.32 | 9.9926667 | + 3.6 | 5 3 56.48 |
| 5 | 5 | 284 55 12.2 | 55 27.3 | 152.93 | 0.21 | 9.9926764 | 4.4 | 5 0 0.57 |
| 6 | 6 | 285 56 22.7 | 56 37.6 | 152.94 | + 0.08 | 9.9926881 | 5.2 | 4 56 4.65 |
| 7 | 7 | 286 57 33.2 | 57 47.9 | 152.94 | — 0.05 | 9.9927016 | + 6.0 | 4 52 8.74 |
| 8 | 8 | 287 58 43.7 | 58 58.1 | 152.93 | 0.18 | 9.9927168 | 6.7 | 4 48 12.83 |
| 9 | 9 | 288 59 54.0 | 60 8.3 | 152.92 | 0.30 | 9.9927337 | 7.4 | 4 44 16.92 |
| 10 | 10 | 290 1 4.1 | 1 18.3 | 152.92 | — 0.40 | 9.9927523 | + 8.1 | 4 40 21.00 |
| 11 | 11 | 291 2 13.9 | 2 27.9 | 152.90 | 0.49 | 9.9927725 | 8.8 | 4 36 25.09 |
| 12 | 12 | 292 3 23.2 | 3 37.0 | 152.88 | 0.55 | 9.9927943 | 9.4 | 4 32 29.18 |
| 13 | 13 | 293 4 31.9 | 4 45.5 | 152.85 | — 0.59 | 9.9928178 | +10.1 | 4 28 33.27 |
| 14 | 14 | 294 5 40.0 | 5 53.4 | 152.82 | 0.60 | 9.9928431 | 10.9 | 4 24 37.36 |
| 15 | 15 | 295 6 47.4 | 7 0.6 | 152.79 | 0.57 | 9.9928702 | 11.7 | 4 20 41.45 |
| 16 | 16 | 296 7 54.0 | 8 7.1 | 152.76 | — 0.52 | 9.9928992 | +12.5 | 4 16 45.53 |
| 17 | 17 | 297 8 59.9 | 9 12.8 | 152.73 | 0.45 | 9.9929302 | 13.4 | 4 12 49.61 |
| 18 | 18 | 298 10 4.9 | 10 17.6 | 152.69 | 0.34 | 9.9929633 | 14.3 | 4 8 53.70 |
| 19 | 19 | 299 11 8.9 | 11 21.5 | 152.65 | — 0.23 | 9.9929987 | +15.3 | 4 4 57.79 |
| 20 | 20 | 300 12 12.0 | 12 24.4 | 152.61 | — 0.10 | 9.9930365 | 16.3 | 4 1 1.88 |
| 21 | 21 | 301 13 14.1 | 13 26.4 | 152.57 | + 0.04 | 9.9930768 | 17.3 | 3 57 5.97 |
| 22 | 22 | 302 14 15.3 | 14 27.4 | 152.53 | + 0.17 | 9.9931196 | +18.4 | 3 53 10.07 |
| 23 | 23 | 303 15 15.6 | 15 27.5 | 152.49 | 0.30 | 9.9931649 | 19.5 | 3 49 14.16 |
| 24 | 24 | 304 16 14.9 | 16 26.7 | 152.45 | 0.41 | 9.9932129 | 20.6 | 3 45 18.24 |
| 25 | 25 | 305 17 13.3 | 17 25.0 | 152.41 | + 0.49 | 9.9932637 | +21.7 | 3 41 22.32 |
| 26 | 26 | 306 18 10.9 | 18 22.4 | 152.38 | 0.55 | 9.9933172 | 22.8 | 3 37 26.41 |
| 27 | 27 | 307 19 7.6 | 19 18.9 | 152.34 | 0.58 | 9.9933733 | 23.9 | 3 33 30.50 |
| 28 | 28 | 308 20 3.5 | 20 14.7 | 152.31 | + 0.58 | 9.9934318 | +24.9 | 3 29 34.59 |
| 29 | 29 | 309 20 58.7 | 21 9.8 | 152.28 | 0.56 | 9.9934928 | 25.9 | 3 25 38.68 |
| 30 | 30 | 310 21 53.1 | 22 4.1 | 152.25 | 0.51 | 9.9935562 | 26.9 | 3 21 42.77 |
| 31 | 31 | 311 22 46.7 | 22 57.5 | 152.22 | 0.43 | 9.9936219 | 27.8 | 3 17 46.86 |
| 32 | 32 | 312 23 39.5 | 23 50.2 | 152.19 | + 0.32 | 9.9936897 | +28.6 | 3 13 50.95 |
| NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^h .0. | | | | | | | | Diff. for 1 Hour, — 9 ^s .8296. (Table II.) |

GREENWICH MEAN TIME.

THE MOON'S

| Day of the Month. | THE MOON'S | | | | | | | | |
|-------------------|----------------|-----------|----------------------|-------------------|-----------|-------------------|-----------------------------------|-------------------|-------------------|
| | SEMI-DIAMETER. | | HORIZONTAL PARALLAX. | | | | UPPER TRANSIT. | | AGE. |
| | Noon. | Midnight. | Noon. | Diff. for 1 Hour. | Midnight. | Diff. for 1 Hour. | Meridian of Greenwich. | Diff. for 1 Hour. | Noon. |
| 1 | 14' 48.5 | 14' 50.7 | 54' 14.2 | +0.57 | 54' 22.2 | +0.78 | ^h 17 ^m 15.4 | ^m 1.70 | ^d 20.4 |
| 2 | 14 53.6 | 14 57.1 | 54 32.7 | 0.99 | 54 45.8 | 1.20 | 17 56.2 | 1.72 | 21.4 |
| 3 | 15 1.4 | 15 6.3 | 55 1.4 | 1.41 | 55 19.5 | 1.61 | 18 37.8 | 1.78 | 22.4 |
| 4 | 15 11.9 | 15 18.0 | 55 39.9 | +1.79 | 56 2.5 | +1.96 | 19 21.5 | 1.89 | 23.4 |
| 5 | 15 24.7 | 15 31.7 | 56 26.9 | 2.10 | 56 52.9 | 2.22 | 20 8.5 | 2.05 | 24.4 |
| 6 | 15 39.2 | 15 46.7 | 57 20.1 | 2.29 | 57 47.9 | 2.32 | 20 59.9 | 2.24 | 25.4 |
| 7 | 15 54.3 | 16 1.8 | 58 15.8 | +2.31 | 58 43.3 | +2.25 | 21 56.3 | 2.45 | 26.4 |
| 8 | 16 9.0 | 16 15.7 | 59 9.7 | 2.13 | 59 34.3 | 1.95 | 22 57.3 | 2.63 | 27.4 |
| 9 | 16 21.7 | 16 26.9 | 59 56.4 | 1.72 | 60 15.5 | 1.44 | 6 | | 28.4 |
| 10 | 16 31.1 | 16 34.3 | 60 31.0 | +1.13 | 60 42.5 | +0.78 | 0 1.1 | 2.66 | 29.4 |
| 11 | 16 36.2 | 16 37.0 | 60 49.7 | +0.42 | 60 52.5 | +0.05 | 1 4.9 | 2.61 | 0.9 |
| 12 | 16 36.6 | 16 35.0 | 60 51.0 | -0.30 | 60 45.3 | -0.64 | 2 6.2 | 2.47 | 1.9 |
| 13 | 16 32.4 | 16 28.9 | 60 35.7 | -0.94 | 60 22.7 | -1.21 | 3 3.3 | 2.30 | 2.9 |
| 14 | 16 24.5 | 16 19.6 | 60 6.8 | 1.42 | 59 48.6 | 1.59 | 3 56.8 | 2.16 | 3.9 |
| 15 | 16 14.1 | 16 8.3 | 59 28.6 | 1.72 | 59 7.3 | 1.80 | 4 47.1 | 2.05 | 4.9 |
| 16 | 16 2.4 | 15 56.3 | 58 45.4 | -1.84 | 58 23.2 | -1.85 | 5 35.4 | 2.00 | 5.9 |
| 17 | 15 50.3 | 15 44.4 | 58 1.0 | 1.83 | 57 39.3 | 1.78 | 6 23.0 | 1.99 | 6.9 |
| 18 | 15 38.6 | 15 33.1 | 57 18.2 | 1.72 | 56 58.0 | 1.64 | 7 11.1 | 2.02 | 7.9 |
| 19 | 15 27.9 | 15 23.0 | 56 38.8 | -1.56 | 56 20.7 | -1.47 | 8 0.1 | 2.07 | 8.9 |
| 20 | 15 18.3 | 15 14.0 | 56 3.6 | 1.38 | 55 47.7 | 1.28 | 8 50.7 | 2.13 | 9.9 |
| 21 | 15 9.9 | 15 6.2 | 55 32.8 | 1.20 | 55 19.0 | 1.11 | 9 42.5 | 2.17 | 10.9 |
| 22 | 15 2.7 | 14 59.5 | 55 6.3 | -1.01 | 54 54.6 | -0.93 | 10 34.8 | 2.16 | 11.9 |
| 23 | 14 56.6 | 14 54.0 | 54 44.0 | 0.85 | 54 34.4 | 0.76 | 11 26.4 | 2.11 | 12.9 |
| 24 | 14 51.7 | 14 49.7 | 54 25.8 | 0.67 | 54 18.3 | 0.58 | 12 16.3 | 2.03 | 13.9 |
| 25 | 14 47.9 | 14 46.4 | 54 11.8 | -0.49 | 54 6.5 | -0.39 | 13 3.8 | 1.93 | 14.9 |
| 26 | 14 45.3 | 14 44.6 | 54 2.5 | 0.28 | 53 59.8 | -0.16 | 13 48.8 | 1.83 | 15.9 |
| 27 | 14 44.3 | 14 44.4 | 53 58.6 | -0.04 | 53 58.9 | +0.10 | 14 31.6 | 1.75 | 16.9 |
| 28 | 14 44.9 | 14 46.0 | 54 1.0 | +0.25 | 54 4.9 | +0.41 | 15 12.8 | 1.70 | 17.9 |
| 29 | 14 47.6 | 14 49.7 | 54 10.7 | 0.56 | 54 18.4 | 0.73 | 15 53.1 | 1.68 | 18.9 |
| 30 | 14 52.4 | 14 55.7 | 54 28.3 | 0.93 | 54 40.6 | 1.12 | 16 33.7 | 1.72 | 19.9 |
| 31 | 14 59.7 | 15 4.2 | 54 55.1 | 1.31 | 55 11.9 | 1.50 | 17 15.5 | 1.79 | 20.9 |
| 32 | 15 9.4 | 15 15.3 | 55 31.0 | +1.69 | 55 52.4 | +1.87 | 17 59.7 | 1.92 | 21.9 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|------------------------|-----------------|------------------------|-------------|------------------|------------------------|-----------------|------------------------|
| THURSDAY 1. | | | | | SATURDAY 3. | | | | |
| 0 | 11 30 17.34 | 1.8977 | N. 8° 52' 21.6" | 11.965 | 0 | 12 57 32.42 | 1.8344 | S. 1° 12' 54.0" | 13.013 |
| 1 | 11 32 6.96 | 1.8983 | 8 40 22.6 | 12.009 | 1 | 12 59 22.54 | 1.8363 | 1 25 55.0 | 13.019 |
| 2 | 11 33 56.50 | 1.8989 | 8 28 21.4 | 12.038 | 2 | 13 1 12.78 | 1.8382 | 1 38 56.3 | 13.024 |
| 3 | 11 35 45.96 | 1.8937 | 8 16 18.0 | 12.073 | 3 | 13 3 3.13 | 1.8403 | 1 51 57.9 | 13.029 |
| 4 | 11 37 35.34 | 1.8994 | 8 4 12.6 | 12.108 | 4 | 13 4 53.61 | 1.8425 | 2 4 59.8 | 13.033 |
| 5 | 11 39 24.65 | 1.8912 | 7 52 5.1 | 12.142 | 5 | 13 6 44.23 | 1.8447 | 2 18 1.9 | 13.037 |
| 6 | 11 41 13.89 | 1.8901 | 7 39 55.6 | 12.175 | 6 | 13 8 34.98 | 1.8470 | 2 31 4.2 | 13.039 |
| 7 | 11 43 3.06 | 1.8190 | 7 27 44.1 | 12.207 | 7 | 13 10 25.87 | 1.8493 | 2 44 6.6 | 13.041 |
| 8 | 11 44 52.17 | 1.8181 | 7 15 30.7 | 12.239 | 8 | 13 12 16.90 | 1.8517 | 2 57 9.1 | 13.042 |
| 9 | 11 46 41.23 | 1.8172 | 7 3 15.4 | 12.271 | 9 | 13 14 8.08 | 1.8542 | 3 10 11.7 | 13.043 |
| 10 | 11 48 30.23 | 1.8163 | 6 50 58.2 | 12.302 | 10 | 13 15 59.41 | 1.8569 | 3 23 14.3 | 13.042 |
| 11 | 11 50 19.18 | 1.8154 | 6 38 39.2 | 12.332 | 11 | 13 17 50.90 | 1.8596 | 3 36 16.8 | 13.041 |
| 12 | 11 52 8.08 | 1.8147 | 6 26 18.4 | 12.361 | 12 | 13 19 42.56 | 1.8623 | 3 49 19.2 | 13.039 |
| 13 | 11 53 56.94 | 1.8140 | 6 13 55.8 | 12.390 | 13 | 13 21 34.38 | 1.8651 | 4 2 21.5 | 13.037 |
| 14 | 11 55 45.76 | 1.8134 | 6 1 31.5 | 12.419 | 14 | 13 23 26.37 | 1.8680 | 4 15 23.6 | 13.033 |
| 15 | 11 57 34.55 | 1.8128 | 5 49 5.5 | 12.447 | 15 | 13 25 18.54 | 1.8710 | 4 28 25.5 | 13.029 |
| 16 | 11 59 23.30 | 1.8123 | 5 36 37.9 | 12.474 | 16 | 13 27 10.89 | 1.8741 | 4 41 27.1 | 13.024 |
| 17 | 12 1 12.03 | 1.8190 | 5 24 8.7 | 12.501 | 17 | 13 29 3.43 | 1.8772 | 4 54 28.4 | 13.018 |
| 18 | 12 3 0.74 | 1.8117 | 5 11 37.8 | 12.527 | 18 | 13 30 56.15 | 1.8804 | 5 7 29.3 | 13.012 |
| 19 | 12 4 49.43 | 1.8114 | 4 59 5.4 | 12.552 | 19 | 13 32 49.07 | 1.8837 | 5 20 29.8 | 13.005 |
| 20 | 12 6 38.11 | 1.8112 | 4 46 31.5 | 12.577 | 20 | 13 34 42.19 | 1.8871 | 5 33 29.9 | 12.997 |
| 21 | 12 8 26.77 | 1.8110 | 4 33 56.2 | 12.601 | 21 | 13 36 35.52 | 1.8905 | 5 46 29.4 | 12.987 |
| 22 | 12 10 15.43 | 1.8110 | 4 21 19.4 | 12.624 | 22 | 13 38 29.05 | 1.8940 | 5 59 28.3 | 12.977 |
| 23 | 12 12 4.09 | 1.8110 | N. 4 8 41.3 | 12.647 | 23 | 13 40 22.80 | 1.8977 | S. 6 12 26.7 | 12.967 |
| FRIDAY 2. | | | | | SUNDAY 4. | | | | |
| 0 | 12 13 52.75 | 1.8110 | N. 3 56 1.8 | 12.669 | 0 | 13 42 16.77 | 1.9014 | S. 6 25 24.4 | 12.956 |
| 1 | 12 15 41.41 | 1.8112 | 3 43 21.0 | 12.691 | 1 | 13 44 10.96 | 1.9051 | 6 38 21.4 | 12.943 |
| 2 | 12 17 30.09 | 1.8114 | 3 30 38.9 | 12.712 | 2 | 13 46 5.38 | 1.9090 | 6 51 17.5 | 12.930 |
| 3 | 12 19 18.78 | 1.8117 | 3 17 55.6 | 12.732 | 3 | 13 48 0.04 | 1.9129 | 7 4 13.0 | 12.916 |
| 4 | 12 21 7.49 | 1.8121 | 3 5 11.1 | 12.752 | 4 | 13 49 54.93 | 1.9168 | 7 17 7.5 | 12.900 |
| 5 | 12 22 56.23 | 1.8125 | 2 52 25.4 | 12.772 | 5 | 13 51 50.06 | 1.9209 | 7 30 1.0 | 12.883 |
| 6 | 12 24 44.99 | 1.8130 | 2 39 38.5 | 12.790 | 6 | 13 53 45.44 | 1.9251 | 7 42 53.5 | 12.867 |
| 7 | 12 26 33.79 | 1.8136 | 2 26 50.6 | 12.808 | 7 | 13 55 41.07 | 1.9293 | 7 55 45.0 | 12.850 |
| 8 | 12 28 22.62 | 1.8142 | 2 14 1.6 | 12.826 | 8 | 13 57 36.96 | 1.9336 | 8 8 35.5 | 12.832 |
| 9 | 12 30 11.49 | 1.8149 | 2 1 11.6 | 12.842 | 9 | 13 59 33.11 | 1.9380 | 8 21 24.8 | 12.812 |
| 10 | 12 32 0.40 | 1.8157 | 1 48 20.6 | 12.857 | 10 | 14 1 29.52 | 1.9425 | 8 34 12.9 | 12.791 |
| 11 | 12 33 49.37 | 1.8166 | 1 35 28.7 | 12.872 | 11 | 14 3 26.21 | 1.9471 | 8 46 59.7 | 12.769 |
| 12 | 12 35 38.39 | 1.8174 | 1 22 35.9 | 12.887 | 12 | 14 5 23.17 | 1.9517 | 8 59 45.2 | 12.747 |
| 13 | 12 37 27.46 | 1.8184 | 1 9 42.3 | 12.902 | 13 | 14 7 20.41 | 1.9564 | 9 12 29.3 | 12.723 |
| 14 | 12 39 16.60 | 1.8196 | 0 56 47.8 | 12.915 | 14 | 14 9 17.94 | 1.9612 | 9 25 12.0 | 12.698 |
| 15 | 12 41 5.81 | 1.8208 | 0 43 52.5 | 12.928 | 15 | 14 11 15.76 | 1.9661 | 9 37 53.1 | 12.673 |
| 16 | 12 42 55.09 | 1.8220 | 0 30 56.4 | 12.940 | 16 | 14 13 13.87 | 1.9710 | 9 50 32.7 | 12.647 |
| 17 | 12 44 44.45 | 1.8232 | 0 17 59.7 | 12.951 | 17 | 14 15 12.28 | 1.9760 | 10 3 10.7 | 12.619 |
| 18 | 12 46 33.88 | 1.8246 | N. 0 5 2.3 | 12.962 | 18 | 14 17 10.99 | 1.9811 | 10 15 47.0 | 12.590 |
| 19 | 12 48 23.40 | 1.8261 | S. 0 7 55.8 | 12.972 | 19 | 14 19 10.01 | 1.9863 | 10 28 21.5 | 12.560 |
| 20 | 12 50 13.01 | 1.8276 | 0 20 54.4 | 12.982 | 20 | 14 21 9.35 | 1.9916 | 10 40 54.2 | 12.530 |
| 21 | 12 52 2.71 | 1.8292 | 0 33 53.6 | 12.991 | 21 | 14 23 9.00 | 1.9969 | 10 53 25.1 | 12.498 |
| 22 | 12 53 52.51 | 1.8308 | 0 46 53.3 | 12.998 | 22 | 14 25 8.97 | 2.0023 | 11 5 54.0 | 12.465 |
| 23 | 12 55 42.41 | 1.8326 | 0 59 53.4 | 13.006 | 23 | 14 27 9.27 | 2.0078 | 11 18 20.9 | 12.431 |
| 24 | 12 57 32.42 | 1.8344 | S. 1 12 54.0 | 13.013 | 24 | 14 29 9.91 | 2.0134 | S. 11 30 45.7 | 12.395 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|------------|------------------|---------------------|------------------|---------------------|--------------|------------------|---------------------|------------------|---------------------|
| MONDAY 5. | | | | | WEDNESDAY 7. | | | | |
| 0 | h m s | s | S. 11° 30' 45.7" | 12.395 | 0 | h m s | s | S. 20° 20' 38.0" | 9.193 |
| 1 | 14 29 9.91 | 2.0134 | 11 43 8.3 | 12.359 | 1 | 16 13 27.18 | 2.3515 | 20 29 42.2 | 9.017 |
| 2 | 14 31 10.88 | 2.0190 | 11 55 28.8 | 12.322 | 2 | 16 15 48.51 | 2.3595 | 20 38 40.0 | 8.909 |
| 3 | 14 33 12.19 | 2.0247 | 12 7 47.0 | 12.283 | 3 | 16 18 10.32 | 2.3674 | 20 47 31.3 | 8.799 |
| 4 | 14 35 13.84 | 2.0304 | 12 20 2.8 | 12.243 | 4 | 16 20 32.60 | 2.3753 | 20 56 15.9 | 8.688 |
| 5 | 14 37 15.84 | 2.0363 | 12 32 16.2 | 12.202 | 5 | 16 22 55.36 | 2.3832 | 21 4 53.8 | 8.575 |
| 6 | 14 39 18.20 | 2.0422 | 12 44 27.1 | 12.160 | 6 | 16 25 18.59 | 2.3912 | 21 13 24.9 | 8.460 |
| 7 | 14 41 20.91 | 2.0482 | 12 56 35.4 | 12.117 | 7 | 16 27 42.30 | 2.3992 | 21 21 49.0 | 8.343 |
| 8 | 14 43 23.98 | 2.0543 | 13 8 41.1 | 12.072 | 8 | 16 30 6.49 | 2.4071 | 21 30 6.1 | 8.226 |
| 9 | 14 45 27.42 | 2.0604 | 13 20 44.1 | 12.027 | 9 | 16 32 31.15 | 2.4149 | 21 38 16.1 | 8.106 |
| 10 | 14 47 31.23 | 2.0667 | 13 32 44.3 | 11.979 | 10 | 16 34 56.28 | 2.4227 | 21 46 18.8 | 7.983 |
| 11 | 14 49 35.42 | 2.0730 | 13 44 41.6 | 11.930 | 11 | 16 37 21.88 | 2.4306 | 21 54 14.1 | 7.860 |
| 12 | 14 51 39.99 | 2.0793 | 13 56 35.9 | 11.880 | 12 | 16 39 47.95 | 2.4384 | 22 2 2.0 | 7.735 |
| 13 | 14 53 44.94 | 2.0857 | 14 8 27.2 | 11.829 | 13 | 16 42 14.49 | 2.4463 | 22 9 42.3 | 7.608 |
| 14 | 14 55 50.27 | 2.0922 | 14 20 15.4 | 11.777 | 14 | 16 44 41.49 | 2.4539 | 22 17 15.0 | 7.480 |
| 15 | 14 57 56.00 | 2.0987 | 14 32 0.5 | 11.724 | 15 | 16 47 8.96 | 2.4616 | 22 24 39.9 | 7.350 |
| 16 | 15 0 2.12 | 2.1054 | 14 43 42.3 | 11.668 | 16 | 16 49 36.89 | 2.4693 | 22 31 57.0 | 7.218 |
| 17 | 15 2 8.64 | 2.1121 | 14 55 20.7 | 11.612 | 17 | 16 52 5.28 | 2.4770 | 22 39 6.1 | 7.084 |
| 18 | 15 4 15.57 | 2.1188 | 15 6 55.7 | 11.554 | 18 | 16 54 34.13 | 2.4846 | 22 46 7.1 | 6.949 |
| 19 | 15 6 22.90 | 2.1256 | 15 18 27.2 | 11.495 | 19 | 16 57 3.43 | 2.4921 | 22 53 0.0 | 6.819 |
| 20 | 15 8 30.64 | 2.1325 | 15 29 55.1 | 11.435 | 20 | 16 59 33.18 | 2.4996 | 22 59 44.6 | 6.673 |
| 21 | 15 10 38.80 | 2.1394 | 15 41 19.4 | 11.373 | 21 | 17 2 3.38 | 2.5070 | 23 6 20.8 | 6.533 |
| 22 | 15 12 47.37 | 2.1463 | 15 52 39.9 | 11.310 | 22 | 17 4 34.02 | 2.5144 | 23 12 48.6 | 6.392 |
| 23 | 15 14 56.36 | 2.1534 | S. 16° 3' 56.6" | 11.245 | 23 | 17 7 5.10 | 2.5217 | S. 23° 19' 7.8" | 6.248 |
| 24 | 15 17 5.78 | 2.1605 | | | | 17 9 36.62 | 2.5289 | | |
| TUESDAY 6. | | | | | THURSDAY 8. | | | | |
| 0 | h m s | s | S. 16° 15' 9.3" | 11.178 | 0 | h m s | s | S. 23° 25' 18.3" | 6.103 |
| 1 | 15 19 15.62 | 2.1676 | 16 26 18.0 | 11.111 | 1 | 17 12 8.57 | 2.5361 | 23 31 20.1 | 5.956 |
| 2 | 15 21 25.89 | 2.1748 | 16 37 22.6 | 11.042 | 2 | 17 14 40.95 | 2.5439 | 23 37 13.0 | 5.808 |
| 3 | 15 23 36.60 | 2.1821 | 16 48 23.0 | 10.971 | 3 | 17 17 13.75 | 2.5509 | 23 42 57.0 | 5.658 |
| 4 | 15 25 47.75 | 2.1895 | 16 59 19.1 | 10.899 | 4 | 17 19 46.97 | 2.5571 | 23 48 31.9 | 5.506 |
| 5 | 15 27 59.34 | 2.1968 | 17 10 10.9 | 10.826 | 5 | 17 22 20.60 | 2.5639 | 23 53 57.7 | 5.352 |
| 6 | 15 30 11.37 | 2.2042 | 17 20 58.2 | 10.750 | 6 | 17 24 54.64 | 2.5706 | 23 59 14.2 | 5.198 |
| 7 | 15 32 23.84 | 2.2116 | 17 31 40.9 | 10.673 | 7 | 17 27 29.07 | 2.5773 | 24 4 21.4 | 5.042 |
| 8 | 15 34 36.76 | 2.2191 | 17 42 19.0 | 10.596 | 8 | 17 30 3.90 | 2.5838 | 24 9 19.2 | 4.884 |
| 9 | 15 36 50.14 | 2.2267 | 17 52 52.4 | 10.516 | 9 | 17 32 39.12 | 2.5903 | 24 14 7.5 | 4.725 |
| 10 | 15 39 3.97 | 2.2343 | 18 3 20.9 | 10.434 | 10 | 17 35 14.73 | 2.5967 | 24 18 46.2 | 4.564 |
| 11 | 15 41 18.26 | 2.2419 | 18 13 44.5 | 10.352 | 11 | 17 37 50.72 | 2.6038 | 24 23 15.2 | 4.402 |
| 12 | 15 43 33.00 | 2.2495 | 18 24 3.1 | 10.267 | 12 | 17 40 27.07 | 2.6109 | 24 27 34.5 | 4.239 |
| 13 | 15 45 48.20 | 2.2572 | 18 34 16.6 | 10.181 | 13 | 17 43 3.79 | 2.6150 | 24 31 43.9 | 4.074 |
| 14 | 15 48 3.87 | 2.2650 | 18 44 24.8 | 10.092 | 14 | 17 45 40.87 | 2.6208 | 24 35 43.4 | 3.908 |
| 15 | 15 50 20.00 | 2.2728 | 18 54 27.7 | 10.003 | 15 | 17 48 18.29 | 2.6265 | 24 39 32.9 | 3.741 |
| 16 | 15 52 36.60 | 2.2806 | 19 4 25.2 | 9.919 | 16 | 17 50 56.05 | 2.6322 | 24 43 12.3 | 3.572 |
| 17 | 15 54 53.67 | 2.2883 | 19 14 17.2 | 9.839 | 17 | 17 53 34.15 | 2.6377 | 24 46 41.5 | 3.402 |
| 18 | 15 57 11.20 | 2.2961 | 19 24 3.5 | 9.759 | 18 | 17 56 12.57 | 2.6430 | 24 50 0.5 | 3.231 |
| 19 | 15 59 29.20 | 2.3040 | 19 33 44.1 | 9.678 | 19 | 17 58 51.31 | 2.6482 | 24 53 9.2 | 3.058 |
| 20 | 16 1 47.63 | 2.3119 | 19 43 18.9 | 9.593 | 20 | 18 1 30.36 | 2.6533 | 24 56 7.5 | 2.885 |
| 21 | 16 4 6.63 | 2.3198 | 19 52 47.8 | 9.503 | 21 | 18 4 9.71 | 2.6589 | 24 58 55.4 | 2.711 |
| 22 | 16 6 26.05 | 2.3277 | 20 2 10.7 | 9.432 | 22 | 18 6 49.35 | 2.6631 | 25 1 32.8 | 2.535 |
| 23 | 16 8 45.95 | 2.3357 | 20 11 27.5 | 9.358 | 23 | 18 9 29.28 | 2.6677 | 25 3 59.6 | 2.357 |
| 24 | 16 11 6.33 | 2.3436 | S. 20° 20' 38.0" | 9.283 | 24 | 18 12 9.48 | 2.6722 | | |
| | 16 13 27.18 | 2.3515 | | 9.207 | | 18 14 49.94 | 2.6765 | | |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|------------------|---------------------|------------|------------------|---------------------|------------------|---------------------|
| FRIDAY 9. | | | | | SUNDAY 11. | | | | |
| 0 | 18 14 49.94 | 2.6705 | S. 25° 6' 15.7" | 9.179 | 0 | 20 25 0.46 | 2.6797 | S. 23° 17' 26.6" | 6.667 |
| 1 | 18 17 30.66 | 2.6807 | 25 8 21.1 | 2.001 | 1 | 20 27 41.12 | 2.6757 | 23 10 41.4 | 6.639 |
| 2 | 18 20 11.63 | 2.6847 | 25 10 15.8 | 1.892 | 2 | 20 30 21.54 | 2.6716 | 23 3 45.9 | 7.009 |
| 3 | 18 22 52.83 | 2.6886 | 25 11 59.8 | 1.642 | 3 | 20 33 1.71 | 2.6673 | 22 56 40.3 | 7.178 |
| 4 | 18 25 34.26 | 2.6923 | 25 13 32.9 | 1.400 | 4 | 20 35 41.62 | 2.6629 | 22 49 24.6 | 7.346 |
| 5 | 18 28 15.91 | 2.6959 | 25 14 55.0 | 1.278 | 5 | 20 38 21.26 | 2.6583 | 22 41 58.8 | 7.512 |
| 6 | 18 30 57.77 | 2.6992 | 25 16 6.2 | 1.095 | 6 | 20 41 0.62 | 2.6537 | 22 34 23.1 | 7.677 |
| 7 | 18 33 39.82 | 2.7024 | 25 17 6.4 | 0.911 | 7 | 20 43 39.70 | 2.6490 | 22 26 37.5 | 7.841 |
| 8 | 18 36 22.06 | 2.7055 | 25 17 55.5 | 0.727 | 8 | 20 46 18.50 | 2.6442 | 22 18 42.2 | 8.003 |
| 9 | 18 39 4.48 | 2.7083 | 25 18 33.6 | 0.542 | 9 | 20 48 57.00 | 2.6392 | 22 10 37.2 | 8.163 |
| 10 | 18 41 47.06 | 2.7109 | 25 19 0.6 | 0.357 | 10 | 20 51 35.20 | 2.6341 | 22 2 22.6 | 8.323 |
| 11 | 18 44 29.79 | 2.7134 | 25 19 16.4 | - 0.170 | 11 | 20 54 13.09 | 2.6289 | 21 53 58.4 | 8.482 |
| 12 | 18 47 12.67 | 2.7157 | 25 19 21.0 | + 0.017 | 12 | 20 56 50.67 | 2.6237 | 21 45 24.8 | 8.638 |
| 13 | 18 49 55.68 | 2.7179 | 25 19 14.4 | 0.204 | 13 | 20 59 27.93 | 2.6183 | 21 36 41.9 | 8.792 |
| 14 | 18 52 38.82 | 2.7199 | 25 18 56.5 | 0.399 | 14 | 21 2 4.87 | 2.6128 | 21 27 49.8 | 8.944 |
| 15 | 18 55 22.07 | 2.7217 | 25 18 27.4 | 0.579 | 15 | 21 4 41.47 | 2.6073 | 21 18 48.6 | 9.095 |
| 16 | 18 58 5.42 | 2.7232 | 25 17 47.0 | 0.767 | 16 | 21 7 17.74 | 2.6017 | 21 9 38.4 | 9.244 |
| 17 | 19 0 48.86 | 2.7246 | 25 16 55.3 | 0.956 | 17 | 21 9 53.67 | 2.5960 | 21 0 19.3 | 9.392 |
| 18 | 19 3 32.37 | 2.7258 | 25 15 52.3 | 1.144 | 18 | 21 12 29.26 | 2.5903 | 20 50 51.3 | 9.539 |
| 19 | 19 6 15.95 | 2.7268 | 25 14 38.0 | 1.333 | 19 | 21 15 4.51 | 2.5845 | 20 41 14.6 | 9.683 |
| 20 | 19 8 59.59 | 2.7277 | 25 13 12.3 | 1.522 | 20 | 21 17 39.40 | 2.5785 | 20 31 29.3 | 9.825 |
| 21 | 19 11 43.28 | 2.7284 | 25 11 35.3 | 1.712 | 21 | 21 20 13.93 | 2.5725 | 20 21 35.6 | 9.965 |
| 22 | 19 14 27.00 | 2.7288 | 25 9 46.9 | 1.901 | 22 | 21 22 48.10 | 2.5665 | 20 11 33.5 | 10.104 |
| 23 | 19 17 10.74 | 2.7292 | S. 25° 7' 47.2" | 2.090 | 23 | 21 25 21.91 | 2.5605 | S. 20° 1' 23.1" | 10.242 |
| SATURDAY 10. | | | | | MONDAY 12. | | | | |
| 0 | 19 19 54.50 | 2.7293 | S. 25° 5' 36.1" | 2.279 | 0 | 21 27 55.36 | 2.5544 | S. 19° 51' 4.5" | 10.377 |
| 1 | 19 22 38.26 | 2.7292 | 25 3 13.7 | 2.468 | 1 | 21 30 28.44 | 2.5482 | 19 40 37.9 | 10.510 |
| 2 | 19 25 22.01 | 2.7289 | 25 0 40.0 | 2.657 | 2 | 21 33 1.14 | 2.5419 | 19 30 3.3 | 10.642 |
| 3 | 19 28 5.73 | 2.7284 | 24 57 54.9 | 2.846 | 3 | 21 35 33.47 | 2.5356 | 19 19 20.9 | 10.771 |
| 4 | 19 30 49.42 | 2.7278 | 24 54 58.5 | 3.033 | 4 | 21 38 5.42 | 2.5294 | 19 8 30.8 | 10.898 |
| 5 | 19 33 33.07 | 2.7271 | 24 51 50.9 | 3.221 | 5 | 21 40 36.99 | 2.5231 | 18 57 33.1 | 11.025 |
| 6 | 19 36 16.67 | 2.7261 | 24 48 32.0 | 3.409 | 6 | 21 43 8.19 | 2.5167 | 18 46 27.8 | 11.149 |
| 7 | 19 39 0.20 | 2.7249 | 24 45 1.8 | 3.596 | 7 | 21 45 39.00 | 2.5102 | 18 35 15.2 | 11.271 |
| 8 | 19 41 43.66 | 2.7236 | 24 41 20.5 | 3.782 | 8 | 21 48 9.42 | 2.5038 | 18 23 55.3 | 11.391 |
| 9 | 19 44 27.03 | 2.7220 | 24 37 28.0 | 3.968 | 9 | 21 50 39.46 | 2.4974 | 18 12 28.3 | 11.508 |
| 10 | 19 47 10.30 | 2.7203 | 24 33 24.3 | 4.154 | 10 | 21 53 9.11 | 2.4910 | 18 0 54.3 | 11.624 |
| 11 | 19 49 53.47 | 2.7185 | 24 29 9.5 | 4.339 | 11 | 21 55 38.38 | 2.4846 | 17 49 13.4 | 11.739 |
| 12 | 19 52 36.52 | 2.7164 | 24 24 43.6 | 4.523 | 12 | 21 58 7.26 | 2.4781 | 17 37 25.6 | 11.852 |
| 13 | 19 55 19.44 | 2.7142 | 24 20 6.7 | 4.707 | 13 | 22 0 35.75 | 2.4716 | 17 25 31.1 | 11.962 |
| 14 | 19 58 2.23 | 2.7119 | 24 15 18.8 | 4.890 | 14 | 22 3 3.85 | 2.4651 | 17 13 30.1 | 12.069 |
| 15 | 20 0 44.87 | 2.7093 | 24 10 19.9 | 5.072 | 15 | 22 5 31.56 | 2.4586 | 17 1 22.8 | 12.174 |
| 16 | 20 3 27.35 | 2.7066 | 24 5 10.1 | 5.253 | 16 | 22 7 58.88 | 2.4521 | 16 49 9.2 | 12.279 |
| 17 | 20 6 9.66 | 2.7037 | 23 59 49.5 | 5.433 | 17 | 22 10 25.81 | 2.4457 | 16 36 49.3 | 12.383 |
| 18 | 20 8 51.80 | 2.7008 | 23 54 18.2 | 5.612 | 18 | 22 12 52.36 | 2.4392 | 16 24 23.2 | 12.484 |
| 19 | 20 11 33.76 | 2.6977 | 23 48 36.1 | 5.791 | 19 | 22 15 18.52 | 2.4327 | 16 11 51.2 | 12.582 |
| 20 | 20 14 15.52 | 2.6943 | 23 42 43.3 | 5.968 | 20 | 22 17 44.29 | 2.4262 | 15 59 13.4 | 12.678 |
| 21 | 20 16 57.08 | 2.6909 | 23 36 39.9 | 6.145 | 21 | 22 20 9.67 | 2.4198 | 15 46 29.9 | 12.773 |
| 22 | 20 19 38.43 | 2.6873 | 23 30 25.9 | 6.321 | 22 | 22 22 34.67 | 2.4134 | 15 33 40.7 | 12.865 |
| 23 | 20 22 19.56 | 2.6836 | 23 24 1.4 | 6.494 | 23 | 22 24 59.28 | 2.4070 | 15 20 46.1 | 12.955 |
| 24 | 20 25 0.46 | 2.6797 | S. 23° 17' 26.6" | 6.667 | 24 | 22 27 23.51 | 2.4007 | S. 15° 7' 46.1" | 13.043 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|--|---------------------|----------------|---------------------|--------------|--------------------------------------|---------------------|----------------|---------------------|
| TUESDAY 13. | | | | | THURSDAY 15. | | | | |
| 0 | ^h 22 ^m 27 ^s 23.51 | 2.4007 | S. 15° 7' 46.1 | 13.043 | 0 | ^h 0 16 ^m 10.43 | 2.1589 | S. 3° 35' 27.4 | 15.130 |
| 1 | 22 29 47.36 | 2.3943 | 14 54 40.9 | 13.130 | 1 | 0 18 19.70 | 2.1589 | 3 20 19.5 | 15.132 |
| 2 | 22 32 10.83 | 2.3880 | 14 41 30.5 | 13.215 | 2 | 0 20 28.78 | 2.1497 | 3 5 11.5 | 15.133 |
| 3 | 22 34 33.92 | 2.3817 | 14 28 15.1 | 13.297 | 3 | 0 22 37.67 | 2.1466 | 2 50 3.5 | 15.133 |
| 4 | 22 36 56.63 | 2.3754 | 14 14 54.8 | 13.378 | 4 | 0 24 46.37 | 2.1434 | 2 34 55.5 | 15.132 |
| 5 | 22 39 18.97 | 2.3692 | 14 1 29.7 | 13.457 | 5 | 0 26 54.88 | 2.1403 | 2 19 47.6 | 15.129 |
| 6 | 22 41 40.94 | 2.3631 | 13 48 0.0 | 13.533 | 6 | 0 29 3.20 | 2.1373 | 2 4 40.0 | 15.124 |
| 7 | 22 44 2.54 | 2.3569 | 13 34 25.7 | 13.608 | 7 | 0 31 11.35 | 2.1345 | 1 49 32.7 | 15.119 |
| 8 | 22 46 23.77 | 2.3508 | 13 20 47.0 | 13.681 | 8 | 0 33 19.34 | 2.1317 | 1 34 25.7 | 15.113 |
| 9 | 22 48 44.63 | 2.3447 | 13 7 4.0 | 13.752 | 9 | 0 35 27.16 | 2.1290 | 1 19 19.1 | 15.105 |
| 10 | 22 51 5.13 | 2.3387 | 12 53 16.8 | 13.821 | 10 | 0 37 34.82 | 2.1263 | 1 4 13.1 | 15.095 |
| 11 | 22 53 25.27 | 2.3327 | 12 39 25.5 | 13.888 | 11 | 0 39 42.32 | 2.1237 | 0 49 7.7 | 15.083 |
| 12 | 22 55 45.06 | 2.3268 | 12 25 30.2 | 13.953 | 12 | 0 41 49.67 | 2.1212 | 0 34 3.1 | 15.070 |
| 13 | 22 58 4.49 | 2.3209 | 12 11 31.1 | 14.017 | 13 | 0 43 56.87 | 2.1189 | 0 18 59.3 | 15.057 |
| 14 | 23 0 23.57 | 2.3151 | 11 57 28.2 | 14.078 | 14 | 0 46 3.94 | 2.1166 | S. 0 3 56.3 | 15.043 |
| 15 | 23 2 42.31 | 2.3094 | 11 43 21.7 | 14.137 | 15 | 0 48 10.87 | 2.1143 | N. 0 11 5.9 | 15.027 |
| 16 | 23 5 0.70 | 2.3037 | 11 29 11.7 | 14.195 | 16 | 0 50 17.66 | 2.1122 | 0 26 7.0 | 15.009 |
| 17 | 23 7 18.75 | 2.2980 | 11 14 58.3 | 14.252 | 17 | 0 52 24.33 | 2.1102 | 0 41 7.0 | 14.990 |
| 18 | 23 9 36.46 | 2.2923 | 11 0 41.5 | 14.306 | 18 | 0 54 30.88 | 2.1082 | 0 56 5.8 | 14.969 |
| 19 | 23 11 53.83 | 2.2867 | 10 46 21.5 | 14.358 | 19 | 0 56 37.31 | 2.1062 | 1 11 3.3 | 14.948 |
| 20 | 23 14 10.87 | 2.2813 | 10 31 58.5 | 14.407 | 20 | 0 58 43.63 | 2.1043 | 1 25 59.6 | 14.927 |
| 21 | 23 16 27.59 | 2.2760 | 10 17 32.6 | 14.456 | 21 | 1 0 49.83 | 2.1025 | 1 40 54.5 | 14.903 |
| 22 | 23 18 43.99 | 2.2706 | 10 3 3.8 | 14.503 | 22 | 1 2 55.93 | 2.1009 | 1 55 47.9 | 14.878 |
| 23 | 23 21 0.07 | 2.2653 | S. 9 48 32.2 | 14.549 | 23 | 1 5 1.94 | 2.0993 | N. 2 10 39.8 | 14.859 |
| WEDNESDAY 14. | | | | | FRIDAY 16. | | | | |
| 0 | 23 23 15.83 | 2.2601 | S. 9 33 57.9 | 14.592 | 0 | 1 7 7.85 | 2.0977 | N. 2 25 30.1 | 14.824 |
| 1 | 23 25 31.28 | 2.2549 | 9 19 21.1 | 14.633 | 1 | 1 9 13.67 | 2.0963 | 2 40 18.7 | 14.795 |
| 2 | 23 27 46.42 | 2.2498 | 9 4 41.9 | 14.672 | 2 | 1 11 19.41 | 2.0950 | 2 55 5.5 | 14.765 |
| 3 | 23 30 1.26 | 2.2448 | 8 50 0.4 | 14.711 | 3 | 1 13 25.07 | 2.0937 | 3 9 50.5 | 14.734 |
| 4 | 23 32 15.80 | 2.2398 | 8 35 16.6 | 14.747 | 4 | 1 15 30.66 | 2.0925 | 3 24 33.6 | 14.702 |
| 5 | 23 34 30.04 | 2.2349 | 8 20 30.7 | 14.782 | 5 | 1 17 36.17 | 2.0913 | 3 39 14.8 | 14.669 |
| 6 | 23 36 43.90 | 2.2301 | 8 5 42.8 | 14.814 | 6 | 1 19 41.61 | 2.0902 | 3 53 53.9 | 14.634 |
| 7 | 23 38 57.66 | 2.2254 | 7 50 53.0 | 14.846 | 7 | 1 21 46.99 | 2.0892 | 4 8 30.9 | 14.599 |
| 8 | 23 41 11.04 | 2.2207 | 7 36 1.3 | 14.875 | 8 | 1 23 52.32 | 2.0883 | 4 23 5.8 | 14.562 |
| 9 | 23 43 24.14 | 2.2161 | 7 21 8.0 | 14.902 | 9 | 1 25 57.59 | 2.0875 | 4 37 38.4 | 14.524 |
| 10 | 23 45 36.97 | 2.2116 | 7 6 13.1 | 14.928 | 10 | 1 28 2.82 | 2.0867 | 4 52 8.7 | 14.485 |
| 11 | 23 47 49.54 | 2.2072 | 6 51 16.6 | 14.953 | 11 | 1 30 8.00 | 2.0860 | 5 6 36.6 | 14.445 |
| 12 | 23 50 1.84 | 2.2028 | 6 36 18.7 | 14.978 | 12 | 1 32 13.14 | 2.0853 | 5 21 2.1 | 14.404 |
| 13 | 23 52 13.88 | 2.1985 | 6 21 19.5 | 14.997 | 13 | 1 34 18.24 | 2.0848 | 5 35 25.1 | 14.362 |
| 14 | 23 54 25.66 | 2.1943 | 6 6 19.0 | 15.017 | 14 | 1 36 23.32 | 2.0844 | 5 49 45.5 | 14.318 |
| 15 | 23 56 37.19 | 2.1902 | 5 51 17.4 | 15.035 | 15 | 1 38 28.37 | 2.0840 | 6 4 3.3 | 14.272 |
| 16 | 23 58 48.48 | 2.1861 | 5 36 14.8 | 15.052 | 16 | 1 40 33.40 | 2.0836 | 6 18 18.3 | 14.228 |
| 17 | 0 0 59.52 | 2.1820 | 5 21 11.2 | 15.067 | 17 | 1 42 38.41 | 2.0833 | 6 32 30.6 | 14.182 |
| 18 | 0 3 10.32 | 2.1781 | 5 6 6.8 | 15.080 | 18 | 1 44 43.40 | 2.0831 | 6 46 40.1 | 14.134 |
| 19 | 0 5 20.89 | 2.1743 | 4 51 1.6 | 15.092 | 19 | 1 46 48.38 | 2.0830 | 7 0 46.7 | 14.085 |
| 20 | 0 7 31.24 | 2.1706 | 4 35 55.7 | 15.102 | 20 | 1 48 53.36 | 2.0830 | 7 14 50.3 | 14.035 |
| 21 | 0 9 41.36 | 2.1669 | 4 20 49.3 | 15.111 | 21 | 1 50 58.34 | 2.0830 | 7 28 50.9 | 13.984 |
| 22 | 0 11 51.26 | 2.1633 | 4 5 42.4 | 15.118 | 22 | 1 53 3.32 | 2.0830 | 7 42 48.4 | 13.932 |
| 23 | 0 14 0.95 | 2.1597 | 3 50 35.1 | 15.125 | 23 | 1 55 8.30 | 2.0831 | 7 56 42.7 | 13.879 |
| 24 | 0 16 10.43 | 2.1562 | S. 3 35 27.4 | 15.130 | 24 | 1 57 13.29 | 2.0833 | N. 8 10 33.9 | 13.826 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|---------------|---------------------|-------------|------------------|---------------------|---------------|---------------------|
| SATURDAY 17. | | | | | MONDAY 19. | | | | |
| 0 | 1 57 13.29 | 2.0833 | N. 8 10 33.9 | 13.896 | 0 | 3 38 30.21 | 2.1533 | N. 17 53 55.4 | 10.137 |
| 1 | 1 59 18.30 | 2.0836 | 8 24 21.8 | 13.771 | 1 | 3 40 39.48 | 2.1556 | 18 4 0.7 | 10.039 |
| 2 | 2 1 23.33 | 2.0839 | 8 38 6.4 | 13.714 | 2 | 3 42 48.88 | 2.1579 | 18 14 0.1 | 9.940 |
| 3 | 2 3 28.37 | 2.0842 | 8 51 47.5 | 13.657 | 3 | 3 44 58.43 | 2.1603 | 18 23 53.5 | 9.840 |
| 4 | 2 5 33.44 | 2.0847 | 9 5 25.2 | 13.599 | 4 | 3 47 8.12 | 2.1626 | 18 33 40.9 | 9.740 |
| 5 | 2 7 38.54 | 2.0853 | 9 18 59.4 | 13.541 | 5 | 3 49 17.94 | 2.1649 | 18 43 22.3 | 9.640 |
| 6 | 2 9 43.68 | 2.0860 | 9 32 30.1 | 13.482 | 6 | 3 51 27.90 | 2.1672 | 18 52 57.7 | 9.538 |
| 7 | 2 11 48.86 | 2.0866 | 9 45 57.2 | 13.420 | 7 | 3 53 38.00 | 2.1695 | 19 2 26.9 | 9.435 |
| 8 | 2 13 54.07 | 2.0872 | 9 59 20.5 | 13.358 | 8 | 3 55 48.24 | 2.1719 | 19 11 49.9 | 9.332 |
| 9 | 2 15 59.32 | 2.0879 | 10 12 40.1 | 13.295 | 9 | 3 57 58.63 | 2.1743 | 19 21 6.7 | 9.228 |
| 10 | 2 18 4.62 | 2.0888 | 10 25 55.9 | 13.232 | 10 | 4 0 9.16 | 2.1767 | 19 30 17.3 | 9.123 |
| 11 | 2 20 9.98 | 2.0897 | 10 39 7.9 | 13.167 | 11 | 4 2 19.83 | 2.1790 | 19 39 21.5 | 9.018 |
| 12 | 2 22 15.39 | 2.0906 | 10 52 15.9 | 13.106 | 12 | 4 4 30.64 | 2.1813 | 19 48 19.4 | 8.912 |
| 13 | 2 24 20.85 | 2.0916 | 11 5 19.9 | 13.033 | 13 | 4 6 41.59 | 2.1837 | 19 57 10.9 | 8.805 |
| 14 | 2 26 26.38 | 2.0927 | 11 18 19.9 | 12.967 | 14 | 4 8 52.68 | 2.1861 | 20 5 56.0 | 8.697 |
| 15 | 2 28 31.97 | 2.0938 | 11 31 15.9 | 12.899 | 15 | 4 11 3.92 | 2.1885 | 20 14 34.6 | 8.589 |
| 16 | 2 30 37.63 | 2.0949 | 11 44 7.8 | 12.829 | 16 | 4 13 15.30 | 2.1908 | 20 23 6.7 | 8.480 |
| 17 | 2 32 43.36 | 2.0961 | 11 56 55.4 | 12.758 | 17 | 4 15 26.81 | 2.1931 | 20 31 32.2 | 8.370 |
| 18 | 2 34 49.16 | 2.0973 | 12 9 38.7 | 12.686 | 18 | 4 17 38.47 | 2.1955 | 20 39 51.1 | 8.260 |
| 19 | 2 36 55.04 | 2.0987 | 12 22 17.7 | 12.614 | 19 | 4 19 50.27 | 2.1978 | 20 48 3.4 | 8.149 |
| 20 | 2 39 1.00 | 2.1000 | 12 34 52.4 | 12.542 | 20 | 4 22 2.20 | 2.2000 | 20 56 9.0 | 8.038 |
| 21 | 2 41 7.04 | 2.1014 | 12 47 22.7 | 12.468 | 21 | 4 24 14.27 | 2.2022 | 21 4 7.9 | 7.926 |
| 22 | 2 43 13.17 | 2.1029 | 12 59 48.5 | 12.392 | 22 | 4 26 26.48 | 2.2046 | 21 12 0.1 | 7.812 |
| 23 | 2 45 19.39 | 2.1043 | N. 13 12 9.7 | 12.316 | 23 | 4 28 38.82 | 2.2068 | N. 21 19 45.4 | 7.698 |
| SUNDAY 18. | | | | | TUESDAY 20. | | | | |
| 0 | 2 47 25.69 | 2.1058 | N. 13 24 26.4 | 12.240 | 0 | 4 30 51.29 | 2.2089 | N. 21 27 23.9 | 7.584 |
| 1 | 2 49 32.09 | 2.1075 | 13 36 38.5 | 12.162 | 1 | 4 33 3.89 | 2.2112 | 21 34 55.5 | 7.469 |
| 2 | 2 51 38.59 | 2.1091 | 13 48 45.8 | 12.083 | 2 | 4 35 16.63 | 2.2134 | 21 42 20.2 | 7.354 |
| 3 | 2 53 45.18 | 2.1108 | 14 0 48.4 | 12.003 | 3 | 4 37 29.50 | 2.2156 | 21 49 38.0 | 7.238 |
| 4 | 2 55 51.88 | 2.1125 | 14 12 46.2 | 11.923 | 4 | 4 39 42.50 | 2.2177 | 21 56 48.8 | 7.122 |
| 5 | 2 57 58.68 | 2.1142 | 14 24 39.1 | 11.842 | 5 | 4 41 55.63 | 2.2198 | 22 3 52.6 | 7.005 |
| 6 | 3 0 5.58 | 2.1159 | 14 36 27.2 | 11.760 | 6 | 4 44 8.88 | 2.2218 | 22 10 49.4 | 6.887 |
| 7 | 3 2 12.59 | 2.1177 | 14 48 10.3 | 11.677 | 7 | 4 46 22.25 | 2.2239 | 22 17 39.1 | 6.768 |
| 8 | 3 4 19.71 | 2.1196 | 14 59 48.4 | 11.592 | 8 | 4 48 35.75 | 2.2260 | 22 24 21.6 | 6.649 |
| 9 | 3 6 26.95 | 2.1216 | 15 11 21.4 | 11.507 | 9 | 4 50 49.37 | 2.2280 | 22 30 57.0 | 6.530 |
| 10 | 3 8 34.30 | 2.1235 | 15 22 49.3 | 11.422 | 10 | 4 53 3.11 | 2.2299 | 22 37 25.2 | 6.410 |
| 11 | 3 10 41.77 | 2.1254 | 15 34 12.0 | 11.336 | 11 | 4 55 16.96 | 2.2318 | 22 43 46.2 | 6.290 |
| 12 | 3 12 49.25 | 2.1273 | 15 45 29.6 | 11.249 | 12 | 4 57 30.93 | 2.2337 | 22 50 0.0 | 6.169 |
| 13 | 3 14 57.05 | 2.1294 | 15 56 41.9 | 11.161 | 13 | 4 59 45.01 | 2.2356 | 22 56 6.5 | 6.048 |
| 14 | 3 17 4.88 | 2.1315 | 16 7 48.9 | 11.072 | 14 | 5 1 59.20 | 2.2374 | 23 2 5.7 | 5.926 |
| 15 | 3 19 12.83 | 2.1336 | 16 18 50.5 | 10.982 | 15 | 5 4 13.49 | 2.2391 | 23 7 57.6 | 5.803 |
| 16 | 3 21 20.91 | 2.1357 | 16 29 46.7 | 10.891 | 16 | 5 6 27.89 | 2.2408 | 23 13 42.1 | 5.680 |
| 17 | 3 23 29.11 | 2.1378 | 16 40 37.4 | 10.799 | 17 | 5 8 42.30 | 2.2425 | 23 19 19.2 | 5.557 |
| 18 | 3 25 37.44 | 2.1399 | 16 51 22.6 | 10.707 | 18 | 5 10 56.99 | 2.2442 | 23 24 48.9 | 5.433 |
| 19 | 3 27 45.90 | 2.1421 | 17 2 2.3 | 10.614 | 19 | 5 13 11.69 | 2.2457 | 23 30 11.1 | 5.308 |
| 20 | 3 29 54.49 | 2.1443 | 17 12 36.3 | 10.520 | 20 | 5 15 26.48 | 2.2472 | 23 35 25.9 | 5.184 |
| 21 | 3 32 3.22 | 2.1466 | 17 23 4.7 | 10.426 | 21 | 5 17 41.36 | 2.2487 | 23 40 33.2 | 5.059 |
| 22 | 3 34 12.08 | 2.1488 | 17 33 27.4 | 10.330 | 22 | 5 19 56.33 | 2.2502 | 23 45 33.0 | 4.933 |
| 23 | 3 36 21.08 | 2.1511 | 17 43 44.3 | 10.234 | 23 | 5 22 11.38 | 2.2516 | 23 50 25.2 | 4.808 |
| 24 | 3 38 30.21 | 2.1532 | N. 17 53 55.4 | 10.137 | 24 | 5 24 26.52 | 2.2530 | N. 23 55 9.9 | 4.682 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|------------------|---------------------|----------------|---------------------|--------------|------------------|---------------------|----------------|---------------------|
| WEDNESDAY 21. | | | | | FRIDAY 23. | | | | |
| 0 | h m s | s | N. 23° 55' 9.9 | 4.882 | 0 | h m s | s | N. 25° 11' 3.5 | 1.517 |
| 1 | 5 24 26.52 | 2.9530 | 23 59 47.0 | 4.555 | 1 | 7 12 54.78 | 2.9398 | 25 9 28.7 | 1.643 |
| 2 | 5 26 41.74 | 2.9542 | 24 4 16.5 | 4.498 | 2 | 7 15 9.11 | 2.9378 | 25 7 46.3 | 1.769 |
| 3 | 5 28 57.03 | 2.9554 | 24 8 38.4 | 4.301 | 3 | 7 17 23.32 | 2.9357 | 25 5 56.4 | 1.894 |
| 4 | 5 31 12.39 | 2.9566 | 24 12 52.6 | 4.174 | 4 | 7 19 37.40 | 2.9336 | 25 3 59.0 | 2.019 |
| 5 | 5 33 27.82 | 2.9577 | 24 16 59.2 | 4.046 | 5 | 7 21 51.35 | 2.9314 | 25 1 54.1 | 2.143 |
| 6 | 5 35 43.31 | 2.9588 | 24 20 58.1 | 3.917 | 6 | 7 24 5.17 | 2.9299 | 24 59 41.8 | 2.267 |
| 7 | 5 37 58.87 | 2.9598 | 24 24 49.3 | 3.789 | 7 | 7 26 18.85 | 2.9288 | 24 57 22.1 | 2.390 |
| 8 | 5 40 14.49 | 2.9607 | 24 28 32.8 | 3.661 | 8 | 7 28 32.39 | 2.9244 | 24 54 55.0 | 2.513 |
| 9 | 5 42 30.16 | 2.9616 | 24 32 8.6 | 3.532 | 9 | 7 30 45.78 | 2.9219 | 24 52 20.5 | 2.636 |
| 10 | 5 44 45.88 | 2.9624 | 24 35 36.7 | 3.403 | 10 | 7 32 59.02 | 2.9193 | 24 49 38.7 | 2.758 |
| 11 | 5 47 1.65 | 2.9632 | 24 38 57.0 | 3.273 | 11 | 7 35 12.10 | 2.9168 | 24 46 49.6 | 2.879 |
| 12 | 5 49 17.46 | 2.9638 | 24 42 9.5 | 3.143 | 12 | 7 37 25.03 | 2.9143 | 24 43 53.2 | 3.000 |
| 13 | 5 51 33.31 | 2.9644 | 24 45 14.2 | 3.014 | 13 | 7 39 37.80 | 2.9114 | 24 40 49.6 | 3.120 |
| 14 | 5 53 49.19 | 2.9650 | 24 48 11.2 | 2.885 | 14 | 7 41 50.40 | 2.9087 | 24 37 38.8 | 3.240 |
| 15 | 5 56 5.11 | 2.9656 | 24 51 0.4 | 2.755 | 15 | 7 44 2.84 | 2.9059 | 24 34 20.8 | 3.360 |
| 16 | 5 58 21.06 | 2.9660 | 24 53 41.8 | 2.625 | 16 | 7 46 15.11 | 2.9030 | 24 30 55.6 | 3.479 |
| 17 | 6 0 37.03 | 2.9663 | 24 56 15.4 | 2.494 | 17 | 7 48 27.20 | 2.9001 | 24 27 23.3 | 3.597 |
| 18 | 6 2 53.01 | 2.9665 | 24 58 41.1 | 2.363 | 18 | 7 50 39.12 | 2.1972 | 24 23 43.9 | 3.715 |
| 19 | 6 5 9.01 | 2.9667 | 25 0 59.0 | 2.233 | 19 | 7 52 50.86 | 2.1941 | 24 19 57.5 | 3.832 |
| 20 | 6 7 25.02 | 2.9669 | 25 3 9.1 | 2.103 | 20 | 7 55 2.41 | 2.1910 | 24 16 4.1 | 3.948 |
| 21 | 6 9 41.04 | 2.9670 | 25 5 11.4 | 1.972 | 21 | 7 57 13.78 | 2.1879 | 24 12 3.7 | 4.064 |
| 22 | 6 11 57.06 | 2.9670 | 25 7 5.8 | 1.842 | 22 | 7 59 24.96 | 2.1847 | 24 7 56.4 | 4.179 |
| 23 | 6 14 13.08 | 2.9669 | N. 25 8 52.4 | 1.711 | 23 | 8 1 35.95 | 2.1815 | N. 24 3 42.2 | 4.294 |
| THURSDAY 22. | | | | | SATURDAY 24. | | | | |
| 0 | h m s | s | N. 25 10 31.1 | 1.580 | 0 | h m s | s | N. 23 59 21.1 | 4.408 |
| 1 | 6 18 45.10 | 2.9666 | 25 12 2.0 | 1.450 | 1 | 8 5 57.33 | 2.1748 | 23 54 53.2 | 4.522 |
| 2 | 6 21 1.09 | 2.9663 | 25 13 25.1 | 1.319 | 2 | 8 8 7.72 | 2.1715 | 23 50 18.5 | 4.634 |
| 3 | 6 23 17.06 | 2.9660 | 25 14 40.3 | 1.188 | 3 | 8 10 17.91 | 2.1681 | 23 45 37.1 | 4.746 |
| 4 | 6 25 33.01 | 2.9656 | 25 15 47.7 | 1.058 | 4 | 8 12 27.89 | 2.1647 | 23 40 49.0 | 4.857 |
| 5 | 6 27 48.93 | 2.9651 | 25 16 47.3 | 0.928 | 5 | 8 14 37.67 | 2.1619 | 23 35 54.3 | 4.968 |
| 6 | 6 30 4.82 | 2.9645 | 25 17 39.1 | 0.798 | 6 | 8 16 47.23 | 2.1578 | 23 30 52.9 | 5.078 |
| 7 | 6 32 20.67 | 2.9638 | 25 18 23.1 | 0.667 | 7 | 8 18 56.58 | 2.1540 | 23 25 44.9 | 5.187 |
| 8 | 6 34 36.48 | 2.9631 | 25 18 59.2 | 0.537 | 8 | 8 21 5.71 | 2.1504 | 23 20 30.4 | 5.295 |
| 9 | 6 36 52.24 | 2.9624 | 25 19 27.5 | 0.407 | 9 | 8 23 14.63 | 2.1468 | 23 15 9.5 | 5.403 |
| 10 | 6 39 7.96 | 2.9616 | 25 19 48.0 | 0.277 | 10 | 8 25 23.33 | 2.1431 | 23 9 42.1 | 5.510 |
| 11 | 6 41 23.63 | 2.9606 | 25 20 0.8 | 0.148 | 11 | 8 27 31.81 | 2.1394 | 23 4 8.3 | 5.616 |
| 12 | 6 43 39.23 | 2.9595 | 25 20 5.8 | + 0.018 | 12 | 8 29 40.06 | 2.1357 | 22 58 28.2 | 5.721 |
| 13 | 6 45 54.77 | 2.9584 | 25 20 3.0 | - 0.112 | 13 | 8 31 48.09 | 2.1319 | 22 52 41.8 | 5.826 |
| 14 | 6 48 10.24 | 2.9573 | 25 19 52.4 | 0.941 | 14 | 8 33 55.89 | 2.1281 | 22 46 49.1 | 5.931 |
| 15 | 6 50 25.64 | 2.9561 | 25 19 34.1 | 0.769 | 15 | 8 36 3.46 | 2.1244 | 22 40 50.1 | 6.035 |
| 16 | 6 52 40.97 | 2.9548 | 25 19 8.1 | 0.498 | 16 | 8 38 10.81 | 2.1206 | 22 34 44.9 | 6.137 |
| 17 | 6 54 56.22 | 2.9534 | 25 18 34.4 | 0.677 | 17 | 8 40 17.93 | 2.1167 | 22 28 33.6 | 6.239 |
| 18 | 6 57 11.38 | 2.9519 | 25 17 52.9 | 0.756 | 18 | 8 42 24.81 | 2.1127 | 22 22 16.2 | 6.341 |
| 19 | 6 59 26.45 | 2.9504 | 25 17 3.7 | 0.833 | 19 | 8 44 31.45 | 2.1087 | 22 15 52.7 | 6.441 |
| 20 | 7 1 41.43 | 2.9488 | 25 16 6.9 | 1.010 | 20 | 8 46 37.86 | 2.1048 | 22 9 23.3 | 6.539 |
| 21 | 7 3 56.31 | 2.9473 | 25 15 2.5 | 1.138 | 21 | 8 48 44.03 | 2.1009 | 22 2 48.0 | 6.638 |
| 22 | 7 6 11.09 | 2.9455 | 25 13 50.4 | 1.265 | 22 | 8 50 49.97 | 2.0970 | 21 56 6.8 | 6.736 |
| 23 | 7 8 25.77 | 2.9437 | 25 12 30.7 | 1.391 | 23 | 8 52 55.67 | 2.0930 | 21 49 19.7 | 6.833 |
| 24 | 7 10 40.33 | 2.9418 | N. 25 11 3.5 | 1.517 | 24 | 8 55 1.13 | 2.0890 | N. 21 42 26.8 | 6.930 |
| | 7 12 54.78 | 2.9398 | | | | 8 57 6.35 | 2.0850 | | |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|------------|------------------|---------------------|------------------|---------------------|---------------|------------------|---------------------|------------------|---------------------|
| SUNDAY 25. | | | | | TUESDAY 27. | | | | |
| 0 | h m s | s | N. 21° 42' 26.8" | 6.930 | 0 | h m s | s | N. 14° 34' 23.8" | 10.590 |
| 1 | 8 57 6.35 | 2.0850 | 21 35 28.1 | 7.025 | 1 | 10 32 36.80 | 1.9010 | 14 23 46.7 | 10.647 |
| 2 | 8 59 11.33 | 2.0810 | 21 28 23.8 | 7.119 | 2 | 10 34 30.76 | 1.8978 | 14 13 6.2 | 10.703 |
| 3 | 9 1 16.07 | 2.0769 | 21 21 13.8 | 7.213 | 3 | 10 36 24.53 | 1.8946 | 14 2 22.3 | 10.758 |
| 4 | 9 3 20.56 | 2.0728 | 21 13 58.2 | 7.307 | 4 | 10 38 18.11 | 1.8914 | 13 51 35.2 | 10.812 |
| 5 | 9 5 24.81 | 2.0688 | 21 6 37.0 | 7.399 | 5 | 10 40 11.50 | 1.8882 | 13 40 44.9 | 10.866 |
| 6 | 9 7 28.82 | 2.0647 | 20 59 10.3 | 7.491 | 6 | 10 42 4.70 | 1.8852 | 13 29 51.3 | 10.918 |
| 7 | 9 9 32.58 | 2.0607 | 20 51 38.1 | 7.582 | 7 | 10 43 57.72 | 1.8822 | 13 18 54.6 | 10.970 |
| 8 | 9 11 36.10 | 2.0566 | 20 44 0.5 | 7.671 | 8 | 10 45 50.56 | 1.8792 | 13 7 54.9 | 11.021 |
| 9 | 9 13 39.37 | 2.0525 | 20 36 17.6 | 7.760 | 9 | 10 47 43.22 | 1.8762 | 12 56 52.1 | 11.072 |
| 10 | 9 15 42.40 | 2.0485 | 20 28 29.3 | 7.849 | 10 | 10 49 35.71 | 1.8734 | 12 45 46.3 | 11.122 |
| 11 | 9 17 45.19 | 2.0444 | 20 20 35.7 | 7.936 | 11 | 10 51 28.03 | 1.8706 | 12 34 37.5 | 11.171 |
| 12 | 9 19 47.73 | 2.0403 | 20 12 37.0 | 8.022 | 12 | 10 53 20.18 | 1.8678 | 12 23 25.8 | 11.218 |
| 13 | 9 21 50.08 | 2.0362 | 20 4 33.1 | 8.108 | 13 | 10 55 12.16 | 1.8650 | 12 12 11.3 | 11.265 |
| 14 | 9 23 52.08 | 2.0322 | 19 56 24.1 | 8.193 | 14 | 10 57 3.98 | 1.8623 | 12 0 54.0 | 11.312 |
| 15 | 9 25 53.89 | 2.0283 | 19 48 9.9 | 8.278 | 15 | 10 58 55.64 | 1.8596 | 11 49 33.8 | 11.359 |
| 16 | 9 27 55.46 | 2.0242 | 19 39 50.7 | 8.361 | 16 | 11 0 47.13 | 1.8569 | 11 38 10.9 | 11.403 |
| 17 | 9 29 56.79 | 2.0201 | 19 31 26.6 | 8.443 | 17 | 11 2 38.47 | 1.8544 | 11 26 45.4 | 11.447 |
| 18 | 9 31 57.87 | 2.0160 | 19 22 57.6 | 8.524 | 18 | 11 4 29.66 | 1.8520 | 11 15 17.2 | 11.491 |
| 19 | 9 33 58.71 | 2.0120 | 19 14 23.7 | 8.605 | 19 | 11 6 20.71 | 1.8496 | 11 3 46.4 | 11.534 |
| 20 | 9 35 59.31 | 2.0080 | 19 5 45.0 | 8.685 | 20 | 11 8 11.61 | 1.8471 | 10 52 13.1 | 11.576 |
| 21 | 9 37 59.67 | 2.0040 | 18 57 1.5 | 8.764 | 21 | 11 10 2.36 | 1.8447 | 10 40 37.3 | 11.618 |
| 22 | 9 39 59.79 | 2.0000 | 18 48 13.3 | 8.842 | 22 | 11 11 52.97 | 1.8423 | 10 28 59.0 | 11.659 |
| 23 | 9 41 59.67 | 1.9960 | N. 18 39 20.4 | 8.920 | 23 | 11 13 43.44 | 1.8401 | N. 10 17 18.2 | 11.700 |
| 24 | 9 43 59.31 | 1.9920 | | | | 11 15 33.78 | 1.8379 | | |
| MONDAY 26. | | | | | WEDNESDAY 28. | | | | |
| 0 | 9 45 58.71 | 1.9881 | N. 18 30 22.9 | 8.997 | 0 | 11 17 23.99 | 1.8358 | N. 10 5 35.0 | 11.739 |
| 1 | 9 47 57.88 | 1.9842 | 18 21 20.8 | 9.073 | 1 | 11 19 14.07 | 1.8337 | 9 53 49.5 | 11.778 |
| 2 | 9 49 56.81 | 1.9803 | 18 12 14.2 | 9.147 | 2 | 11 21 4.03 | 1.8316 | 9 42 1.7 | 11.816 |
| 3 | 9 51 55.51 | 1.9764 | 18 3 3.1 | 9.222 | 3 | 11 22 53.86 | 1.8296 | 9 30 11.6 | 11.853 |
| 4 | 9 53 53.98 | 1.9725 | 17 53 47.6 | 9.295 | 4 | 11 24 43.58 | 1.8277 | 9 18 15.3 | 11.889 |
| 5 | 9 55 52.21 | 1.9686 | 17 44 27.7 | 9.367 | 5 | 11 26 33.18 | 1.8258 | 9 6 24.9 | 11.924 |
| 6 | 9 57 50.21 | 1.9648 | 17 35 3.5 | 9.439 | 6 | 11 28 22.67 | 1.8239 | 8 54 28.4 | 11.959 |
| 7 | 9 59 47.98 | 1.9610 | 17 25 35.0 | 9.510 | 7 | 11 30 12.05 | 1.8222 | 8 42 29.8 | 11.994 |
| 8 | 10 1 45.53 | 1.9573 | 17 16 2.3 | 9.580 | 8 | 11 32 1.33 | 1.8204 | 8 30 29.1 | 12.028 |
| 9 | 10 3 42.86 | 1.9536 | 17 6 25.4 | 9.649 | 9 | 11 33 50.50 | 1.8187 | 8 18 26.4 | 12.062 |
| 10 | 10 5 39.96 | 1.9498 | 16 56 44.4 | 9.717 | 10 | 11 35 39.57 | 1.8171 | 8 6 21.7 | 12.094 |
| 11 | 10 7 36.84 | 1.9461 | 16 46 59.3 | 9.785 | 11 | 11 37 28.55 | 1.8156 | 7 54 15.1 | 12.126 |
| 12 | 10 9 33.49 | 1.9424 | 16 37 10.2 | 9.852 | 12 | 11 39 17.44 | 1.8141 | 7 42 6.6 | 12.157 |
| 13 | 10 11 29.92 | 1.9388 | 16 27 17.1 | 9.918 | 13 | 11 41 6.24 | 1.8127 | 7 29 56.2 | 12.187 |
| 14 | 10 13 26.14 | 1.9352 | 16 17 20.1 | 9.983 | 14 | 11 42 54.96 | 1.8113 | 7 17 44.1 | 12.217 |
| 15 | 10 15 22.15 | 1.9317 | 16 7 19.1 | 10.048 | 15 | 11 44 43.60 | 1.8100 | 7 5 30.2 | 12.246 |
| 16 | 10 17 17.94 | 1.9281 | 15 57 14.3 | 10.111 | 16 | 11 46 32.16 | 1.8087 | 6 53 14.6 | 12.274 |
| 17 | 10 19 13.52 | 1.9245 | 15 47 5.8 | 10.174 | 17 | 11 48 20.64 | 1.8074 | 6 40 57.3 | 12.302 |
| 18 | 10 21 8.88 | 1.9210 | 15 36 53.5 | 10.236 | 18 | 11 50 9.05 | 1.8063 | 6 28 38.3 | 12.330 |
| 19 | 10 23 4.04 | 1.9176 | 15 26 37.5 | 10.297 | 19 | 11 51 57.40 | 1.8053 | 6 16 17.7 | 12.356 |
| 20 | 10 24 58.99 | 1.9142 | 15 16 17.9 | 10.357 | 20 | 11 53 45.69 | 1.8042 | 6 3 55.6 | 12.381 |
| 21 | 10 26 53.74 | 1.9108 | 15 5 54.6 | 10.417 | 21 | 11 55 33.91 | 1.8032 | 5 51 32.0 | 12.406 |
| 22 | 10 28 48.29 | 1.9075 | 14 55 27.8 | 10.476 | 22 | 11 57 22.08 | 1.8024 | 5 39 6.9 | 12.430 |
| 23 | 10 30 42.64 | 1.9042 | 14 44 57.5 | 10.533 | 23 | 11 59 10.20 | 1.8016 | 5 26 40.4 | 12.454 |
| 24 | 10 32 36.80 | 1.9010 | N. 14 34 23.8 | 10.590 | 24 | 12 0 58.27 | 1.8008 | N. 5 14 12.4 | 12.477 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|--------------|---------------------|-----------------------------------|------------------|---------------------|--------------|---------------------|
| THURSDAY 29. | | | | | SATURDAY 31. | | | | |
| 0 | 12 0 58.27 | 1.8008 | N. 5 14 12.4 | 12.477 | 0 | 13 27 45.61 | 1.8418 | S. 4 58 47.9 | 12.807 |
| 1 | 12 2 46.30 | 1.8001 | 5 1 43.1 | 12.499 | 1 | 13 29 36.20 | 1.8445 | 5 11 36.1 | 12.797 |
| 2 | 12 4 34.28 | 1.7993 | 4 49 12.5 | 12.521 | 2 | 13 31 26.95 | 1.8471 | 5 24 23.6 | 12.786 |
| 3 | 12 6 22.22 | 1.7987 | 4 36 40.5 | 12.543 | 3 | 13 33 17.85 | 1.8498 | 5 37 10.4 | 12.774 |
| 4 | 12 8 10.13 | 1.7983 | 4 24 7.3 | 12.563 | 4 | 13 35 8.92 | 1.8526 | 5 49 56.5 | 12.762 |
| 5 | 12 9 58.02 | 1.7979 | 4 11 32.9 | 12.583 | 5 | 13 37 0.16 | 1.8555 | 6 2 41.9 | 12.750 |
| 6 | 12 11 45.88 | 1.7975 | 3 58 57.4 | 12.602 | 6 | 13 38 51.58 | 1.8585 | 6 15 26.5 | 12.736 |
| 7 | 12 13 33.72 | 1.7972 | 3 46 20.7 | 12.621 | 7 | 13 40 43.18 | 1.8615 | 6 28 10.2 | 12.721 |
| 8 | 12 15 21.54 | 1.7969 | 3 33 42.9 | 12.638 | 8 | 13 42 34.96 | 1.8646 | 6 40 53.0 | 12.706 |
| 9 | 12 17 9.34 | 1.7966 | 3 21 4.1 | 12.655 | 9 | 13 44 26.93 | 1.8677 | 6 53 34.9 | 12.690 |
| 10 | 12 18 57.13 | 1.7965 | 3 8 24.3 | 12.672 | 10 | 13 46 19.09 | 1.8710 | 7 6 15.8 | 12.673 |
| 11 | 12 20 44.92 | 1.7965 | 2 55 43.5 | 12.688 | 11 | 13 48 11.45 | 1.8744 | 7 18 55.6 | 12.655 |
| 12 | 12 22 32.71 | 1.7965 | 2 43 1.7 | 12.704 | 12 | 13 50 4.02 | 1.8778 | 7 31 34.4 | 12.637 |
| 13 | 12 24 20.50 | 1.7965 | 2 30 19.0 | 12.718 | 13 | 13 51 56.79 | 1.8812 | 7 44 12.1 | 12.617 |
| 14 | 12 26 8.29 | 1.7966 | 2 17 35.5 | 12.732 | 14 | 13 53 49.77 | 1.8848 | 7 56 48.5 | 12.597 |
| 15 | 12 27 56.09 | 1.7968 | 2 4 51.2 | 12.745 | 15 | 13 55 42.97 | 1.8885 | 8 9 23.7 | 12.576 |
| 16 | 12 29 43.91 | 1.7971 | 1 52 6.1 | 12.757 | 16 | 13 57 36.39 | 1.8922 | 8 21 57.6 | 12.554 |
| 17 | 12 31 31.74 | 1.7974 | 1 39 20.3 | 12.769 | 17 | 13 59 30.03 | 1.8959 | 8 34 30.2 | 12.532 |
| 18 | 12 33 19.59 | 1.7977 | 1 26 33.8 | 12.781 | 18 | 14 1 23.90 | 1.8998 | 8 47 1.4 | 12.508 |
| 19 | 12 35 7.47 | 1.7982 | 1 13 46.6 | 12.792 | 19 | 14 3 18.01 | 1.9037 | 8 59 31.2 | 12.483 |
| 20 | 12 36 55.38 | 1.7987 | 1 0 58.8 | 12.801 | 20 | 14 5 12.35 | 1.9077 | 9 11 59.4 | 12.458 |
| 21 | 12 38 43.32 | 1.7993 | 0 48 10.5 | 12.810 | 21 | 14 7 6.93 | 1.9118 | 9 24 26.1 | 12.432 |
| 22 | 12 40 31.30 | 1.8000 | 0 35 21.6 | 12.819 | 22 | 14 9 1.76 | 1.9160 | 9 36 51.2 | 12.405 |
| 23 | 12 42 19.32 | 1.8007 | N. 0 22 32.2 | 12.827 | 23 | 14 10 56.85 | 1.9202 | S. 9 49 14.7 | 12.377 |
| FRIDAY 30. | | | | | SUNDAY, FEBRUARY 1. | | | | |
| 0 | 12 44 7.38 | 1.8014 | N. 0 9 42.3 | 12.835 | 0 | 14 12 52.19 | 1.9245 | S. 10 1 36.5 | 12.348 |
| 1 | 12 45 55.49 | 1.8023 | S. 0 3 8.0 | 12.842 | PHASES OF THE MOON. | | | | |
| 2 | 12 47 43.66 | 1.8033 | 0 15 58.7 | 12.847 | | | | | |
| 3 | 12 49 31.89 | 1.8043 | 0 28 49.7 | 12.852 | | | | | |
| 4 | 12 51 20.18 | 1.8054 | 0 41 41.0 | 12.857 | | | | | |
| 5 | 12 53 8.54 | 1.8066 | 0 54 32.6 | 12.862 | ☾ Last Quarter . . Jan. 2 22 12.1 | | | | |
| 6 | 12 54 56.97 | 1.8078 | 1 7 24.4 | 12.866 | | | | | |
| 7 | 12 56 45.47 | 1.8090 | 1 20 16.4 | 12.867 | | | | | |
| 8 | 12 58 34.05 | 1.8104 | 1 33 8.5 | 12.869 | | | | | |
| 9 | 13 0 22.72 | 1.8118 | 1 46 0.7 | 12.871 | ● New Moon 10 3 24.6 | | | | |
| 10 | 13 2 11.47 | 1.8132 | 1 58 53.0 | 12.872 | | | | | |
| 11 | 13 4 0.31 | 1.8148 | 2 11 45.3 | 12.872 | | | | | |
| 12 | 13 5 49.25 | 1.8165 | 2 24 37.6 | 12.871 | | | | | |
| 13 | 13 7 38.29 | 1.8183 | 2 37 29.8 | 12.869 | ☽ First Quarter. . . . 16 18 17.5 | | | | |
| 14 | 13 9 27.44 | 1.8201 | 2 50 21.9 | 12.867 | | | | | |
| 15 | 13 11 16.70 | 1.8219 | 3 3 13.9 | 12.865 | | | | | |
| 16 | 13 13 6.07 | 1.8237 | 3 16 5.7 | 12.861 | | | | | |
| 17 | 13 14 55.55 | 1.8257 | 3 28 57.2 | 12.857 | ☾ Full Moon 24 12 25.3 | | | | |
| 18 | 13 16 45.15 | 1.8278 | 3 41 48.5 | 12.852 | | | | | |
| 19 | 13 18 34.88 | 1.8300 | 3 54 39.5 | 12.847 | ☾ Perigee Jan. 11 13.8 | | | | |
| 20 | 13 20 24.75 | 1.8322 | 4 7 30.1 | 12.840 | | | | | |
| 21 | 13 22 14.75 | 1.8345 | 4 20 20.3 | 12.832 | | | | | |
| 22 | 13 24 4.89 | 1.8369 | 4 33 10.0 | 12.824 | | | | | |
| 23 | 13 25 55.18 | 1.8393 | 4 45 59.2 | 12.816 | ☾ Apogee 27 3.8 | | | | |
| 24 | 13 27 45.61 | 1.8418 | S. 4 58 47.9 | 12.807 | | | | | |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|------------|----------------|------------|----------------|-------------|----------------|------------|----------------|
| 1 | Pollux W. | 57° 38' 6" | 3076 | 59° 6' 45" | 3071 | 60° 35' 30" | 3066 | 62° 4' 21" | 3061 |
| | Regulus W. | 21 50 43 | 3160 | 23 17 40 | 3145 | 24 44 55 | 3132 | 26 12 26 | 3119 |
| | Spica E. | 33 24 19 | 3153 | 31 57 13 | 3156 | 30 30 11 | 3160 | 29 3 14 | 3164 |
| | VENUS E. | 75 35 52 | 3183 | 74 9 22 | 3181 | 72 42 50 | 3178 | 71 16 15 | 3174 |
| | Antares E. | 79 3 55 | 3083 | 77 35 25 | 3078 | 76 6 49 | 3074 | 74 38 8 | 3069 |
| | SUN E. | 111 4 28 | 3457 | 109 43 16 | 3454 | 108 22 0 | 3448 | 107 0 38 | 3443 |
| 2 | Pollux W. | 69 30 23 | 3097 | 71 0 2 | 3090 | 72 29 50 | 3011 | 73 59 49 | 3002 |
| | Regulus W. | 33 33 40 | 3082 | 35 2 36 | 3052 | 36 31 45 | 3040 | 38 1 8 | 3029 |
| | VENUS E. | 64 2 5 | 3151 | 62 34 57 | 3145 | 61 7 42 | 3138 | 59 40 19 | 3131 |
| | Antares E. | 67 13 3 | 3039 | 65 43 38 | 3032 | 64 14 5 | 3024 | 62 44 22 | 3016 |
| | SUN E. | 100 12 4 | 3408 | 98 49 56 | 3400 | 97 27 39 | 3390 | 96 5 11 | 3380 |
| 3 | Pollux W. | 81 32 42 | 2950 | 83 3 57 | 2939 | 84 35 26 | 2927 | 86 7 11 | 2915 |
| | Regulus W. | 45 31 38 | 2969 | 47 2 30 | 2956 | 48 33 38 | 2942 | 50 5 3 | 2930 |
| | SATURN W. | 26 38 47 | 2970 | 28 9 37 | 2955 | 29 40 46 | 2942 | 31 12 12 | 2927 |
| | VENUS E. | 52 21 4 | 3089 | 50 52 41 | 3080 | 49 24 7 | 3070 | 47 55 21 | 3060 |
| | Antares E. | 55 13 3 | 2969 | 53 42 11 | 2958 | 52 11 5 | 2947 | 50 39 46 | 2936 |
| | SUN E. | 89 9 56 | 3395 | 87 46 13 | 3313 | 86 22 16 | 3300 | 84 58 4 | 3287 |
| 4 | Pollux W. | 93 50 2 | 2846 | 95 23 30 | 2831 | 96 57 17 | 2816 | 98 31 24 | 2801 |
| | Regulus W. | 57 46 30 | 2857 | 59 19 44 | 2842 | 60 53 18 | 2826 | 62 27 12 | 2810 |
| | SATURN W. | 38 54 7 | 2850 | 40 27 30 | 2835 | 42 1 13 | 2818 | 43 35 18 | 2801 |
| | VENUS E. | 40 28 10 | 3003 | 38 58 1 | 2992 | 37 27 38 | 2979 | 35 56 59 | 2967 |
| | Antares E. | 42 59 31 | 2876 | 41 26 42 | 2864 | 39 53 37 | 2852 | 38 20 16 | 2838 |
| | SUN E. | 77 52 57 | 3212 | 76 27 2 | 3196 | 75 0 48 | 3180 | 73 34 15 | 3163 |
| 5 | Regulus W. | 70 22 5 | 2725 | 71 58 11 | 2708 | 73 34 40 | 2690 | 75 11 33 | 2672 |
| | SATURN W. | 51 31 10 | 2716 | 53 7 29 | 2698 | 54 44 12 | 2680 | 56 21 19 | 2662 |
| | Spica W. | 17 7 56 | 2992 | 18 38 19 | 2932 | 20 9 57 | 2861 | 21 42 40 | 2836 |
| | VENUS E. | 28 19 57 | 2909 | 26 47 50 | 2898 | 25 15 29 | 2889 | 23 42 56 | 2880 |
| | SUN E. | 66 16 17 | 3074 | 64 47 36 | 3056 | 63 18 32 | 3038 | 61 49 6 | 3018 |
| 6 | Regulus W. | 83 22 6 | 2580 | 85 1 28 | 2569 | 86 41 15 | 2543 | 88 21 28 | 2525 |
| | SATURN W. | 64 33 6 | 2569 | 66 12 44 | 2550 | 67 52 48 | 2539 | 69 33 17 | 2512 |
| | Spica W. | 29 39 8 | 2666 | 31 16 33 | 2638 | 32 54 36 | 2612 | 34 33 15 | 2587 |
| | SUN E. | 54 15 54 | 2991 | 52 44 2 | 2901 | 51 11 45 | 2882 | 49 39 3 | 2862 |
| 7 | Regulus W. | 96 49 2 | 2432 | 98 31 51 | 2415 | 100 15 5 | 2396 | 101 58 45 | 2379 |
| | Spica W. | 42 54 49 | 2472 | 44 36 42 | 2450 | 46 19 6 | 2429 | 48 2 0 | 2409 |
| | SUN E. | 41 49 15 | 2766 | 40 14 3 | 2747 | 38 38 26 | 2729 | 37 2 25 | 2710 |
| 8 | Spica W. | 56 43 30 | 2314 | 58 29 9 | 2296 | 60 15 14 | 2280 | 62 1 43 | 2263 |
| | SUN E. | 28 56 30 | 2629 | 27 18 14 | 2615 | 25 39 40 | 2602 | 24 0 48 | 2591 |
| 11 | SUN W. | 12 33 44 | 2454 | 14 16 2 | 2434 | 15 58 48 | 2417 | 17 41 59 | 2402 |
| | α Pegasi E. | 53 28 57 | 2729 | 51 52 56 | 2764 | 50 17 41 | 2804 | 48 43 18 | 2849 |
| | α Arietis E. | 93 46 17 | 2153 | 91 56 39 | 2151 | 90 6 58 | 2150 | 88 17 15 | 2149 |
| 12 | SUN W. | 26 21 25 | 2377 | 28 5 33 | 2378 | 29 49 39 | 2380 | 31 33 42 | 2384 |
| | α Arietis E. | 79 9 1 | 2163 | 77 19 37 | 2168 | 75 30 21 | 2174 | 73 41 15 | 2181 |
| | Aldebaran E. | 109 36 21 | 2060 | 107 44 20 | 2064 | 105 52 25 | 2068 | 104 0 36 | 2072 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|------------|----------------|-------------|----------------|------------|----------------|
| 1 | Pollux W. | 63° 33' 18" | 3056 | 65° 2' 22" | 3049 | 66° 31' 34" | 3043 | 68° 0' 54" | 3035 |
| | Regulus W. | 27 40 13 | 3107 | 29 8 14 | 3096 | 30 36 29 | 3084 | 32 4 58 | 3073 |
| | Spica E. | 27 36 22 | 3171 | 26 9 38 | 3178 | 24 43 3 | 3189 | 23 16 41 | 3204 |
| | Venus E. | 69 49 35 | 3171 | 68 22 51 | 3166 | 66 56 1 | 3169 | 65 29 6 | 3157 |
| | Antares E. | 73 9 21 | 3084 | 71 40 27 | 3059 | 70 11 27 | 3052 | 68 42 19 | 3046 |
| | Sun E. | 105 39 10 | 3437 | 104 17 35 | 3431 | 102 55 53 | 3423 | 101 34 3 | 3415 |
| 2 | Pollux W. | 75 29 59 | 2993 | 77 0 21 | 2983 | 78 30 55 | 2973 | 80 1 42 | 2962 |
| | Regulus W. | 39 30 45 | 3018 | 41 0 36 | 3005 | 42 30 42 | 2994 | 44 1 2 | 2981 |
| | Venus E. | 58 12 47 | 3124 | 56 45 6 | 3116 | 55 17 16 | 3107 | 53 49 15 | 3099 |
| | Antares E. | 61 14 29 | 3007 | 59 44 25 | 2998 | 58 14 10 | 2989 | 56 43 43 | 2978 |
| | Sun E. | 94 42 32 | 3371 | 93 19 42 | 3359 | 91 56 39 | 3349 | 90 33 24 | 3338 |
| 3 | Pollux W. | 87 39 11 | 2901 | 89 11 28 | 2888 | 90 44 2 | 2875 | 92 16 53 | 2861 |
| | Regulus W. | 51 36 44 | 2916 | 53 8 43 | 2901 | 54 41 0 | 2887 | 56 13 35 | 2872 |
| | Saturn W. | 32 43 57 | 2912 | 34 16 0 | 2897 | 35 48 23 | 2889 | 37 21 5 | 2866 |
| | Venus E. | 46 26 22 | 3049 | 44 57 10 | 3038 | 43 27 44 | 3026 | 41 58 4 | 3015 |
| | Antares E. | 49 8 13 | 2924 | 47 36 25 | 2912 | 46 4 22 | 2901 | 44 32 4 | 2889 |
| | Sun E. | 83 33 37 | 3272 | 82 8 53 | 3258 | 80 43 52 | 3242 | 79 18 33 | 3228 |
| 4 | Pollux W. | 100 5 51 | 2785 | 101 40 38 | 2769 | 103 15 47 | 2753 | 104 51 17 | 2735 |
| | Regulus W. | 64 1 27 | 2793 | 65 36 4 | 2777 | 67 11 2 | 2760 | 68 46 22 | 2743 |
| | Saturn W. | 45 9 44 | 2785 | 46 44 32 | 2768 | 48 19 42 | 2750 | 49 55 15 | 2734 |
| | Venus E. | 34 26 5 | 2954 | 32 54 55 | 2942 | 31 23 30 | 2931 | 29 51 50 | 2920 |
| | Antares E. | 36 46 38 | 2896 | 35 12 44 | 2885 | 33 38 35 | 2863 | 32 4 11 | 2792 |
| | Sun E. | 72 7 22 | 3146 | 70 40 8 | 3128 | 69 12 32 | 3111 | 67 44 36 | 3092 |
| 5 | Regulus W. | 76 48 51 | 2654 | 78 26 33 | 2636 | 80 4 39 | 2618 | 81 43 10 | 2599 |
| | Saturn W. | 57 58 50 | 2643 | 59 36 46 | 2625 | 61 15 7 | 2606 | 62 53 54 | 2588 |
| | Spica W. | 23 16 21 | 2795 | 24 50 55 | 2760 | 26 26 16 | 2725 | 28 2 22 | 2685 |
| | Venus E. | 22 10 11 | 2873 | 20 37 18 | 2869 | 19 4 20 | 2871 | 17 31 24 | 2869 |
| | Sun E. | 60 19 16 | 2998 | 58 49 1 | 2980 | 57 18 23 | 2961 | 55 47 21 | 2941 |
| 6 | Regulus W. | 90 2 7 | 2506 | 91 43 12 | 2487 | 93 24 43 | 2469 | 95 6 40 | 2451 |
| | Saturn W. | 71 14 13 | 2494 | 72 55 35 | 2475 | 74 37 23 | 2456 | 76 19 38 | 2438 |
| | Spica W. | 36 12 28 | 2569 | 37 52 15 | 2538 | 39 32 35 | 2516 | 41 13 26 | 2493 |
| | Sun E. | 48 5 55 | 2843 | 46 32 23 | 2824 | 44 58 26 | 2804 | 43 24 3 | 2785 |
| 7 | Regulus W. | 103 42 50 | 2361 | 105 27 21 | 2344 | 107 12 16 | 2327 | 108 57 36 | 2311 |
| | Spica W. | 49 45 22 | 2369 | 51 29 13 | 2370 | 53 13 31 | 2350 | 54 58 17 | 2332 |
| | Sun E. | 35 25 59 | 2694 | 33 49 10 | 2676 | 32 11 58 | 2660 | 30 34 25 | 2644 |
| 8 | Spica W. | 63 48 37 | 2247 | 65 35 54 | 2239 | 67 23 34 | 2217 | 69 11 36 | 2202 |
| | Sun E. | 22 21 40 | 2580 | 20 42 18 | 2573 | 19 2 46 | 2567 | 17 23 6 | 2564 |
| 11 | Sun W. | 19 25 31 | 2392 | 21 9 17 | 2384 | 22 53 14 | 2380 | 24 37 18 | 2378 |
| | α Pegasi E. | 47 9 54 | 2901 | 45 37 36 | 2899 | 44 6 32 | 2926 | 42 36 51 | 3102 |
| | α Arietis E. | 86 27 31 | 2150 | 84 37 48 | 2152 | 82 48 8 | 2155 | 80 58 32 | 2158 |
| 12 | Sun W. | 33 17 40 | 2368 | 35 1 32 | 2392 | 36 45 18 | 2398 | 38 28 56 | 2405 |
| | α Arietis E. | 71 52 19 | 2190 | 70 3 36 | 2198 | 68 15 6 | 2208 | 66 26 51 | 2220 |
| | Aldebaran E. | 102 8 54 | 2078 | 100 17 21 | 2083 | 98 25 56 | 2090 | 96 34 41 | 2097 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Noon. | P. L. of Diff. | III ^h . | P. L. of Diff. | VI ^h . | P. L. of Diff. | IX ^h . | P. L. of Diff. |
|-------------------|-------------------------------|----|-------------|----------------|--------------------|----------------|-------------------|----------------|-------------------|----------------|
| 13 | Sun | W. | 40° 12' 24" | 2412 | 41° 55' 42" | 2430 | 43° 38' 48" | 2429 | 45° 21' 42" | 2438 |
| | α Arietis | E. | 64 38 53 | 2232 | 62 51 13 | 2245 | 61 3 52 | 2259 | 59 16 52 | 2274 |
| | Aldebaran | E. | 94 43 37 | 2105 | 92 52 45 | 2113 | 91 2 5 | 2122 | 89 11 39 | 2131 |
| 14 | Sun | W. | 53 52 40 | 2492 | 55 34 5 | 2504 | 57 15 12 | 2516 | 58 56 3 | 2530 |
| | α Arietis | E. | 50 28 4 | 2368 | 48 43 44 | 2381 | 46 59 57 | 2417 | 45 16 46 | 2443 |
| | Aldebaran | E. | 80 3 13 | 2184 | 78 14 21 | 2196 | 76 25 47 | 2208 | 74 37 32 | 2220 |
| 15 | Sun | W. | 67 15 38 | 2599 | 68 54 35 | 2612 | 70 33 13 | 2627 | 72 11 31 | 2641 |
| | Fomalhaut | W. | 33 16 56 | 2876 | 34 49 46 | 2837 | 36 23 26 | 2806 | 37 57 46 | 2780 |
| | Aldebaran | E. | 65 41 2 | 2287 | 63 54 44 | 2301 | 62 8 46 | 2315 | 60 23 9 | 2331 |
| 16 | Sun | W. | 80 18 2 | 2717 | 81 54 19 | 2732 | 83 30 17 | 2747 | 85 5 54 | 2762 |
| | Fomalhaut | W. | 45 55 48 | 2716 | 47 32 6 | 2712 | 49 8 30 | 2710 | 50 44 57 | 2709 |
| | α Pegasi | W. | 33 48 21 | 4064 | 34 58 58 | 3936 | 36 11 41 | 3896 | 37 26 16 | 3731 |
| | Aldebaran | E. | 51 40 27 | 2405 | 49 57 0 | 2420 | 48 13 54 | 2436 | 46 31 10 | 2452 |
| | Pollux | E. | 95 46 22 | 2387 | 94 2 28 | 2400 | 92 18 53 | 2414 | 90 35 38 | 2428 |
| 17 | Sun | W. | 92 59 6 | 2836 | 94 32 47 | 2852 | 96 6 8 | 2866 | 97 39 10 | 2880 |
| | Fomalhaut | W. | 58 46 49 | 2725 | 60 22 56 | 2730 | 61 58 56 | 2736 | 63 34 48 | 2744 |
| | α Pegasi | W. | 44 0 18 | 3418 | 45 22 14 | 3379 | 46 44 54 | 3345 | 48 8 13 | 3316 |
| | Aldebaran | E. | 38 3 10 | 2533 | 36 22 43 | 2550 | 34 42 39 | 2568 | 33 3 0 | 2587 |
| | Pollux | E. | 82 4 19 | 2497 | 80 23 2 | 2510 | 78 42 3 | 2524 | 77 1 23 | 2538 |
| 18 | Sun | W. | 105 19 49 | 2951 | 106 51 3 | 2964 | 108 22 1 | 2977 | 109 52 42 | 2991 |
| | Fomalhaut | W. | 71 31 36 | 2784 | 73 6 25 | 2793 | 74 41 2 | 2802 | 76 15 27 | 2811 |
| | α Pegasi | W. | 55 11 56 | 3921 | 56 37 40 | 3909 | 58 3 38 | 3901 | 59 29 46 | 3193 |
| | Pollux | E. | 68 42 38 | 2802 | 67 3 46 | 2815 | 65 25 11 | 2827 | 63 46 53 | 2839 |
| | Regulus | E. | 104 48 44 | 2807 | 103 9 59 | 2819 | 101 31 30 | 2831 | 99 53 17 | 2843 |
| 19 | Sun | W. | 117 22 2 | 3055 | 118 51 7 | 3067 | 120 19 57 | 3078 | 121 48 33 | 3091 |
| | Fomalhaut | W. | 84 4 25 | 2861 | 85 37 34 | 2871 | 87 10 30 | 2881 | 88 43 13 | 2891 |
| | α Pegasi | W. | 66 42 9 | 3177 | 68 8 46 | 3176 | 69 35 24 | 3177 | 71 2 1 | 3178 |
| | Pollux | E. | 55 39 26 | 2898 | 54 2 44 | 2710 | 52 26 17 | 2721 | 50 50 5 | 2732 |
| | Regulus | E. | 91 46 10 | 2700 | 90 9 30 | 2710 | 88 33 4 | 2721 | 86 56 52 | 2732 |
| 20 | α Pegasi | W. | 78 14 24 | 3195 | 79 40 39 | 3200 | 81 6 48 | 3206 | 82 32 50 | 3211 |
| | α Arietis | W. | 34 37 19 | 3129 | 36 4 53 | 3112 | 37 32 48 | 3098 | 39 1 0 | 3086 |
| | Pollux | E. | 42 52 42 | 2786 | 41 17 56 | 2796 | 39 43 23 | 2807 | 38 9 4 | 2818 |
| | Regulus | E. | 78 59 18 | 2782 | 77 24 26 | 2792 | 75 49 47 | 2801 | 74 15 20 | 2810 |
| 21 | α Arietis | W. | 46 24 46 | 3056 | 47 53 50 | 3053 | 49 22 57 | 3052 | 50 52 6 | 3050 |
| | Pollux | E. | 30 20 56 | 2871 | 28 48 0 | 2883 | 27 15 20 | 2895 | 25 42 55 | 2909 |
| | Regulus | E. | 66 26 1 | 2854 | 64 52 43 | 2862 | 63 19 36 | 2871 | 61 46 40 | 2879 |
| 22 | α Arietis | W. | 58 17 54 | 3055 | 59 46 59 | 3056 | 61 16 2 | 3059 | 62 45 2 | 3062 |
| | Aldebaran | W. | 26 56 42 | 2873 | 28 27 28 | 2874 | 29 58 13 | 2875 | 31 28 57 | 2876 |
| | Regulus | E. | 54 4 33 | 2919 | 52 32 38 | 2926 | 51 0 52 | 2935 | 49 29 17 | 2942 |
| | Spica | E. | 108 7 14 | 2924 | 106 35 26 | 2931 | 105 3 47 | 2938 | 103 32 16 | 2944 |
| 23 | α Arietis | W. | 70 9 7 | 3078 | 71 37 44 | 3081 | 73 6 17 | 3085 | 74 34 45 | 3089 |
| | Aldebaran | W. | 39 2 0 | 2989 | 40 32 26 | 2993 | 42 2 47 | 2997 | 43 33 3 | 3001 |

GREENWICH MEAN TIME.

LUNAR DISTANCES

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|----|------------|----------------|-------------|----------------|------------|----------------|-------------|----------------|
| 13 | Sun | W. | 47° 4' 23" | 9448 | 48° 46' 49" | 9458 | 50° 29' 2" | 9469 | 52° 10' 59" | 9480 |
| | α Arietis | E. | 57 30 15 | 9391 | 55 44 2 | 9309 | 53 58 15 | 9397 | 52 12 55 | 9347 |
| | Aldebaran | E. | 87 21 27 | 9141 | 85 31 30 | 9151 | 83 41 48 | 9161 | 81 52 22 | 9179 |
| 14 | Sun | W. | 60 36 35 | 9543 | 62 16 49 | 9556 | 63 56 44 | 9570 | 65 36 20 | 9583 |
| | α Arietis | E. | 43 34 13 | 9472 | 41 52 21 | 9504 | 40 11 14 | 9538 | 38 30 54 | 9574 |
| | Aldebaran | E. | 72 49 35 | 9233 | 71 1 57 | 9247 | 69 14 39 | 9260 | 67 27 41 | 9273 |
| 15 | Sun | W. | 73 49 30 | 9657 | 75 27 8 | 9679 | 77 4 26 | 9687 | 78 41 24 | 9701 |
| | Fomalhaut | W. | 39 32 40 | 9760 | 41 8 0 | 9744 | 42 43 41 | 9739 | 44 19 38 | 9729 |
| | Aldebaran | E. | 58 37 54 | 9345 | 56 53 0 | 9359 | 55 8 27 | 9375 | 53 24 16 | 9390 |
| 16 | Sun | W. | 86 41 12 | 9777 | 88 16 10 | 9792 | 89 50 48 | 9807 | 91 25 7 | 9822 |
| | Fomalhaut | W. | 52 21 25 | 9710 | 53 57 52 | 9712 | 55 34 16 | 9716 | 57 10 35 | 9719 |
| | α Pegasi | W. | 38 42 30 | 9649 | 40 0 11 | 9578 | 41 19 9 | 9517 | 42 39 14 | 9464 |
| | Aldebaran | E. | 44 48 49 | 9467 | 43 6 50 | 9484 | 41 25 14 | 9499 | 39 44 0 | 9517 |
| | Pollux | E. | 88 52 43 | 9442 | 87 10 8 | 9455 | 85 27 52 | 9470 | 83 45 56 | 9483 |
| 17 | Sun | W. | 99 11 54 | 9894 | 100 44 20 | 9909 | 102 16 27 | 9923 | 103 48 17 | 9937 |
| | Fomalhaut | W. | 65 10 30 | 9750 | 66 46 3 | 9759 | 68 21 25 | 9767 | 69 56 36 | 9775 |
| | α Pegasi | W. | 49 32 6 | 9690 | 50 56 29 | 9699 | 52 21 17 | 9650 | 53 46 27 | 9624 |
| | Aldebaran | E. | 31 23 47 | 9508 | 29 45 0 | 9506 | 28 6 40 | 9546 | 26 28 48 | 9567 |
| | Pollux | E. | 75 21 2 | 9551 | 73 40 59 | 9564 | 72 1 14 | 9577 | 70 21 47 | 9590 |
| 18 | Sun | W. | 111 23 6 | 3005 | 112 53 13 | 3017 | 114 23 5 | 3030 | 115 52 41 | 3048 |
| | Fomalhaut | W. | 77 49 40 | 2821 | 79 23 40 | 2831 | 80 57 28 | 2841 | 82 31 3 | 2851 |
| | α Pegasi | W. | 60 56 4 | 3187 | 62 22 29 | 3183 | 63 48 59 | 3179 | 65 15 33 | 3176 |
| | Pollux | E. | 62 8 51 | 2852 | 60 31 6 | 2863 | 58 53 37 | 2875 | 57 16 24 | 2887 |
| | Regulus | E. | 98 15 21 | 2855 | 96 37 40 | 2866 | 95 0 15 | 2878 | 93 23 5 | 2886 |
| 19 | Sun | W. | 123 16 54 | 3102 | 124 45 1 | 3114 | 126 12 54 | 3125 | 127 40 33 | 3137 |
| | Fomalhaut | W. | 90 15 43 | 2901 | 91 48 0 | 2912 | 93 20 4 | 2923 | 94 51 54 | 2933 |
| | α Pegasi | W. | 72 28 37 | 3180 | 73 55 10 | 3183 | 75 21 39 | 3187 | 76 48 4 | 3191 |
| | Pollux | E. | 49 14 8 | 2743 | 47 38 25 | 2754 | 46 2 57 | 2764 | 44 27 42 | 2775 |
| | Regulus | E. | 85 20 54 | 2749 | 83 45 10 | 2753 | 82 9 40 | 2763 | 80 34 23 | 2772 |
| 20 | α Pegasi | W. | 83 58 46 | 3218 | 85 24 34 | 3225 | 86 50 14 | 3229 | 88 15 45 | 3239 |
| | α Arietis | W. | 40 29 27 | 3077 | 41 58 5 | 3069 | 43 26 52 | 3064 | 44 55 46 | 3059 |
| | Pollux | E. | 36 34 59 | 2828 | 35 1 8 | 2838 | 33 27 30 | 2849 | 31 54 6 | 2860 |
| | Regulus | E. | 72 41 5 | 2819 | 71 7 2 | 2828 | 69 33 10 | 2837 | 67 59 30 | 2845 |
| 21 | α Arietis | W. | 52 21 17 | 3050 | 53 50 28 | 3051 | 55 19 38 | 3052 | 56 48 47 | 3053 |
| | Pollux | E. | 24 10 47 | 2923 | 22 38 56 | 2937 | 21 7 24 | 2952 | 19 36 11 | 2969 |
| | Regulus | E. | 60 13 54 | 2887 | 58 41 18 | 2895 | 57 8 53 | 2903 | 55 36 38 | 2911 |
| 22 | α Arietis | W. | 64 13 58 | 3065 | 65 42 51 | 3068 | 67 11 40 | 3070 | 68 40 26 | 3074 |
| | Aldebaran | W. | 32 59 40 | 2978 | 34 30 20 | 2981 | 36 0 57 | 2984 | 37 31 30 | 2986 |
| | Regulus | E. | 47 57 51 | 2950 | 46 26 35 | 2958 | 44 55 29 | 2965 | 43 24 32 | 2973 |
| | Spica | E. | 102 0 53 | 2950 | 100 29 38 | 2956 | 98 58 30 | 2962 | 97 27 30 | 2969 |
| 23 | α Arietis | W. | 76 3 8 | 3083 | 77 31 26 | 3096 | 78 59 40 | 3101 | 80 27 48 | 3105 |
| | Aldebaran | W. | 45 3 15 | 3005 | 46 33 21 | 3009 | 48 3 23 | 3013 | 49 33 20 | 3017 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|------------|----------------|-------------|----------------|-------------|----------------|
| 23 | Regulus E. | 41° 53' 45" | 2981 | 40° 23' 8" | 2989 | 38° 52' 41" | 2997 | 37° 22' 24" | 3005 |
| | SATURN E. | 60 1 26 | 2942 | 58 30 0 | 2948 | 56 58 42 | 2954 | 55 27 31 | 2960 |
| | Spica E. | 95 56 38 | 2974 | 94 25 53 | 2980 | 92 55 15 | 2985 | 91 24 44 | 2992 |
| 24 | α Arietis W. | 81 55 51 | 3110 | 83 23 49 | 3114 | 84 51 42 | 3119 | 86 19 29 | 3123 |
| | Aldebaran W. | 51 3 12 | 3021 | 52 32 59 | 3025 | 54 2 41 | 3029 | 55 32 18 | 3033 |
| | Regulus E. | 29 53 37 | 3050 | 28 24 26 | 3060 | 26 55 28 | 3073 | 25 26 45 | 3086 |
| | SATURN E. | 47 53 26 | 2989 | 46 22 59 | 2993 | 44 52 38 | 2999 | 43 22 24 | 3004 |
| | Spica E. | 83 53 56 | 3018 | 82 24 6 | 3024 | 80 54 23 | 3029 | 79 24 46 | 3034 |
| 25 | Aldebaran W. | 62 59 12 | 3032 | 64 28 21 | 3055 | 65 57 26 | 3059 | 67 26 26 | 3069 |
| | Pollux W. | 18 55 28 | 3103 | 20 23 34 | 3099 | 21 51 45 | 3096 | 23 20 0 | 3093 |
| | SATURN E. | 35 52 53 | 3031 | 34 23 19 | 3036 | 32 53 51 | 3042 | 31 24 30 | 3047 |
| | Spica E. | 71 58 12 | 3058 | 70 29 11 | 3062 | 69 0 15 | 3067 | 67 31 25 | 3071 |
| 26 | Aldebaran W. | 74 50 20 | 3077 | 76 19 8 | 3079 | 77 47 43 | 3089 | 79 16 15 | 3083 |
| | Pollux W. | 30 41 48 | 3089 | 32 10 11 | 3089 | 33 38 34 | 3090 | 35 6 56 | 3091 |
| | Spica E. | 60 8 30 | 3091 | 58 40 10 | 3095 | 57 11 54 | 3098 | 55 43 42 | 3102 |
| | Antares E. | 106 0 42 | 3077 | 104 32 4 | 3079 | 103 3 29 | 3082 | 101 34 57 | 3083 |
| | VENUS E. | 117 48 2 | 3401 | 116 25 47 | 3405 | 115 3 36 | 3408 | 113 41 28 | 3411 |
| 27 | Aldebaran W. | 86 38 20 | 3092 | 88 6 39 | 3093 | 89 34 57 | 3094 | 91 3 14 | 3094 |
| | Pollux W. | 42 28 37 | 3092 | 43 56 56 | 3093 | 45 25 14 | 3093 | 46 53 32 | 3092 |
| | Spica E. | 48 23 48 | 3119 | 46 56 1 | 3122 | 45 28 18 | 3125 | 44 0 39 | 3129 |
| | Antares E. | 94 12 51 | 3091 | 92 44 31 | 3093 | 91 16 13 | 3093 | 89 47 55 | 3094 |
| | VENUS E. | 106 51 34 | 3422 | 105 29 42 | 3423 | 104 7 52 | 3425 | 102 46 4 | 3426 |
| 28 | Pollux W. | 54 15 13 | 3088 | 55 43 37 | 3087 | 57 12 2 | 3086 | 58 40 29 | 3083 |
| | Regulus W. | 18 29 46 | 3099 | 19 55 53 | 3183 | 21 22 22 | 3189 | 22 49 8 | 3156 |
| | Spica E. | 36 43 24 | 3146 | 35 16 10 | 3149 | 33 49 0 | 3154 | 32 21 56 | 3160 |
| | Antares E. | 82 26 32 | 3094 | 80 58 15 | 3092 | 79 29 56 | 3091 | 78 1 36 | 3089 |
| | VENUS E. | 95 57 15 | 3428 | 94 35 30 | 3427 | 93 13 44 | 3426 | 91 51 57 | 3424 |
| 29 | Pollux W. | 66 3 30 | 3089 | 67 32 18 | 3065 | 69 1 10 | 3060 | 70 30 8 | 3056 |
| | Regulus W. | 30 6 18 | 3110 | 31 34 16 | 3709 | 33 2 23 | 3095 | 34 30 39 | 3083 |
| | Antares E. | 70 39 18 | 3078 | 69 10 41 | 3074 | 67 42 0 | 3070 | 66 13 14 | 3067 |
| | VENUS E. | 85 2 33 | 3414 | 83 40 32 | 3411 | 82 18 28 | 3407 | 80 56 19 | 3403 |
| | SUN E. | 131 1 39 | 3468 | 129 40 39 | 3463 | 128 19 33 | 3458 | 126 58 22 | 3453 |
| 30 | Pollux W. | 77 56 32 | 3097 | 79 26 11 | 3021 | 80 55 58 | 3014 | 82 25 54 | 3006 |
| | Regulus W. | 41 54 20 | 3048 | 43 23 33 | 3040 | 44 52 56 | 3031 | 46 22 30 | 3022 |
| | SATURN W. | 23 58 33 | 3033 | 25 28 5 | 3022 | 26 57 50 | 3013 | 28 27 47 | 3002 |
| | Antares E. | 58 48 5 | 3042 | 57 18 44 | 3035 | 55 49 15 | 3030 | 54 19 39 | 3023 |
| | VENUS E. | 74 4 19 | 3377 | 72 41 36 | 3371 | 71 18 46 | 3365 | 69 55 49 | 3357 |
| | SUN E. | 120 10 47 | 3420 | 118 48 53 | 3412 | 117 26 50 | 3404 | 116 4 38 | 3396 |
| 31 | Pollux W. | 89 58 5 | 2992 | 91 29 6 | 2952 | 93 0 19 | 2942 | 94 31 45 | 2931 |
| | Regulus W. | 53 53 11 | 2974 | 55 23 56 | 2963 | 56 54 55 | 2952 | 58 26 8 | 2941 |
| | SATURN W. | 36 0 45 | 2950 | 37 32 0 | 2939 | 39 3 30 | 2927 | 40 35 15 | 2916 |
| | Antares E. | 46 49 28 | 2985 | 45 18 57 | 2977 | 43 48 15 | 2968 | 42 17 22 | 2960 |
| | VENUS E. | 62 58 47 | 3315 | 61 34 53 | 3305 | 60 10 47 | 3295 | 58 46 30 | 3285 |
| | SUN E. | 109 11 5 | 3346 | 107 47 47 | 3336 | 106 24 17 | 3325 | 105 0 34 | 3313 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XV ^h . | P. L. of Diff. | XVIII ^h . | P. L. of Diff. | XXI ^h . | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|-------------------|----------------|----------------------|----------------|--------------------|----------------|
| 23 | Regulus E. | 35° 52' 17" | 3014 | 34° 22' 21" | 3022 | 32° 52' 35" | 3030 | 31° 23' 0" | 3040 |
| | SATURN E. | 53 56 27 | 2965 | 52 25 31 | 2971 | 50 54 42 | 2977 | 49 24 0 | 2983 |
| | Spica E. | 89 54 21 | 2997 | 88 24 5 | 3002 | 86 53 55 | 3008 | 85 23 52 | 3014 |
| 24 | α Arietis W. | 87 47 11 | 3127 | 89 14 48 | 3132 | 90 42 19 | 3136 | 92 9 45 | 3140 |
| | Aldebaran W. | 57 1 50 | 3037 | 58 31 17 | 3040 | 60 0 40 | 3044 | 61 29 58 | 3047 |
| | Regulus E. | 23 58 18 | 3101 | 22 30 9 | 3116 | 21 2 19 | 3134 | 19 34 51 | 3154 |
| | SATURN E. | 41 52 16 | 3009 | 40 22 15 | 3015 | 38 52 21 | 3021 | 37 22 34 | 3026 |
| | Spica E. | 77 55 15 | 3039 | 76 25 50 | 3044 | 74 56 32 | 3048 | 73 27 19 | 3053 |
| 25 | Aldebaran W. | 68 55 22 | 3065 | 70 24 14 | 3068 | 71 53 3 | 3071 | 73 21 48 | 3073 |
| | Pollux W. | 24 48 18 | 3091 | 26 16 39 | 3090 | 27 45 1 | 3089 | 29 13 24 | 3088 |
| | SATURN E. | 29 55 16 | 3053 | 28 26 9 | 3059 | 26 57 9 | 3065 | 25 28 17 | 3071 |
| | Spica E. | 66 2 40 | 3075 | 64 34 0 | 3079 | 63 5 25 | 3083 | 61 36 55 | 3087 |
| 26 | Aldebaran W. | 80 44 45 | 3086 | 82 13 12 | 3087 | 83 41 37 | 3090 | 85 9 59 | 3091 |
| | Pollux W. | 36 35 17 | 3091 | 38 3 38 | 3091 | 39 31 58 | 3091 | 41 0 18 | 3092 |
| | Spica E. | 54 15 35 | 3105 | 52 47 32 | 3109 | 51 19 33 | 3113 | 49 51 39 | 3115 |
| | Antares E. | 100 6 27 | 3086 | 98 38 0 | 3087 | 97 9 35 | 3089 | 95 41 12 | 3091 |
| | VENUS E. | 112 19 24 | 3414 | 110 57 23 | 3415 | 109 35 24 | 3416 | 108 13 28 | 3420 |
| 27 | Aldebaran W. | 92 31 31 | 3095 | 93 59 47 | 3095 | 95 28 3 | 3095 | 96 56 19 | 3095 |
| | Pollux W. | 48 21 51 | 3092 | 49 50 10 | 3091 | 51 18 30 | 3091 | 52 46 51 | 3090 |
| | Spica E. | 42 33 4 | 3132 | 41 5 33 | 3135 | 39 38 6 | 3138 | 38 10 43 | 3142 |
| | Antares E. | 88 19 38 | 3094 | 86 51 21 | 3095 | 85 23 5 | 3095 | 83 54 49 | 3094 |
| | VENUS E. | 101 24 17 | 3427 | 100 2 31 | 3427 | 98 40 45 | 3428 | 97 19 0 | 3428 |
| 28 | Pollux W. | 60 8 59 | 3082 | 61 37 31 | 3078 | 63 6 7 | 3076 | 64 34 46 | 3072 |
| | Regulus W. | 24 16 10 | 3145 | 25 43 25 | 3135 | 27 10 52 | 3126 | 28 38 30 | 3118 |
| | Spica E. | 30 54 59 | 3165 | 29 28 8 | 3173 | 28 1 26 | 3180 | 26 34 53 | 3180 |
| | Antares E. | 76 33 13 | 3087 | 75 4 48 | 3086 | 73 36 21 | 3083 | 72 7 51 | 3081 |
| | VENUS E. | 90 30 8 | 3423 | 89 8 18 | 3421 | 87 46 25 | 3419 | 86 24 30 | 3417 |
| 29 | Pollux W. | 71 59 12 | 3051 | 73 28 22 | 3046 | 74 57 38 | 3040 | 76 27 1 | 3034 |
| | Regulus W. | 35 59 5 | 3079 | 37 27 40 | 3079 | 38 56 24 | 3065 | 40 25 17 | 3056 |
| | Antares E. | 64 44 24 | 3062 | 63 15 28 | 3058 | 61 46 27 | 3052 | 60 17 19 | 3047 |
| | VENUS E. | 79 34 6 | 3399 | 78 11 48 | 3394 | 76 49 25 | 3388 | 75 26 55 | 3383 |
| | SUN E. | 125 37 5 | 3446 | 124 15 41 | 3440 | 122 54 10 | 3434 | 121 32 32 | 3428 |
| 30 | Pollux W. | 83 55 59 | 2998 | 85 26 14 | 2989 | 86 56 40 | 2981 | 88 27 17 | 2972 |
| | Regulus W. | 47 52 15 | 3014 | 49 22 11 | 3004 | 50 52 19 | 2994 | 52 22 39 | 2985 |
| | SATURN W. | 29 57 57 | 2992 | 31 28 20 | 2982 | 32 58 55 | 2973 | 34 29 43 | 2961 |
| | Antares E. | 52 49 55 | 3016 | 51 20 2 | 3009 | 49 50 0 | 3001 | 48 19 49 | 2993 |
| | VENUS E. | 68 32 43 | 3350 | 67 9 29 | 3341 | 65 46 5 | 3332 | 64 22 31 | 3324 |
| | SUN E. | 114 42 17 | 3386 | 113 19 45 | 3378 | 111 57 3 | 3368 | 110 34 10 | 3358 |
| 31 | Pollux W. | 96 3 25 | 2920 | 97 35 19 | 2908 | 99 7 28 | 2896 | 100 39 52 | 2883 |
| | Regulus W. | 59 57 35 | 2929 | 61 29 17 | 2916 | 63 1 15 | 2905 | 64 33 28 | 2891 |
| | SATURN W. | 42 7 14 | 2903 | 43 39 29 | 2891 | 45 11 59 | 2879 | 46 44 45 | 2866 |
| | Antares E. | 40 46 19 | 2950 | 39 15 4 | 2942 | 37 43 38 | 2933 | 36 12 1 | 2924 |
| | VENUS E. | 57 22 1 | 3275 | 55 57 20 | 3263 | 54 32 25 | 3252 | 53 7 17 | 3239 |
| | SUN E. | 103 36 37 | 3300 | 102 12 25 | 3287 | 100 47 58 | 3274 | 99 23 16 | 3260 |

AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | | Sidereal Time of Semi-diameter Passing Meridian. | Equation of Time, to be Added to Apparent Time. | Diff. for 1 Hour. |
|------------------|-------------------|--|-------------------|-----------------------|-------------------|----------------|-------|--|---|-------------------|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | Semi-diameter. | | | | |
| SUN. | 1 | ^h 20 ^m 59 ^s 27.63 | 10.189 | S. 17° 5' 34.8 | +42.73 | 16' 16.08 | 68.27 | ^m 13 ^s 48.17 | 0.331 | |
| Mon. | 2 | 21 3 31.75 | 10.156 | 16 48 20.4 | 43.47 | 16 15.92 | 68.16 | 13 55.72 | 0.298 | |
| Tues. | 3 | 21 7 35.07 | 10.122 | 16 30 48.3 | 44.20 | 16 15.76 | 68.04 | 14 2.46 | 0.264 | |
| Wed. | 4 | 21 11 37.59 | 10.088 | 16 12 58.9 | +44.91 | 16 15.60 | 67.93 | 14 8.40 | 0.231 | |
| Thur. | 5 | 21 15 39.31 | 10.055 | 15 54 52.6 | 45.60 | 16 15.43 | 67.81 | 14 13.51 | 0.198 | |
| Frid. | 6 | 21 19 40.23 | 10.021 | 15 36 29.9 | 46.28 | 16 15.26 | 67.70 | 14 17.89 | 0.164 | |
| Sat. | 7 | 21 23 40.34 | 9.988 | 15 17 51.2 | +46.94 | 16 15.08 | 67.58 | 14 21.44 | 0.131 | |
| SUN. | 8 | 21 27 39.65 | 9.955 | 14 58 56.9 | 47.58 | 16 14.91 | 67.47 | 14 24.19 | 0.098 | |
| Mon. | 9 | 21 31 38.18 | 9.922 | 14 39 47.4 | 48.20 | 16 14.73 | 67.36 | 14 26.16 | 0.065 | |
| Tues. | 10 | 21 35 35.92 | 9.889 | 14 20 23.2 | +48.80 | 16 14.55 | 67.25 | 14 27.34 | 0.032 | |
| Wed. | 11 | 21 39 32.86 | 9.857 | 14 0 44.7 | 49.39 | 16 14.37 | 67.14 | 14 27.73 | 0.000 | |
| Thur. | 12 | 21 43 29.01 | 9.824 | 13 40 52.3 | 49.96 | 16 14.19 | 67.03 | 14 27.33 | 0.033 | |
| Frid. | 13 | 21 47 24.39 | 9.792 | 13 20 46.6 | +50.51 | 16 14.00 | 66.92 | 14 26.16 | 0.065 | |
| Sat. | 14 | 21 51 19.00 | 9.759 | 13 0 27.9 | 51.03 | 16 13.81 | 66.81 | 14 24.22 | 0.097 | |
| SUN. | 15 | 21 55 12.85 | 9.727 | 12 39 56.6 | 51.55 | 16 13.61 | 66.71 | 14 21.53 | 0.129 | |
| Mon. | 16 | 21 59 5.96 | 9.696 | 12 19 13.2 | +52.05 | 16 13.41 | 66.60 | 14 18.09 | 0.160 | |
| Tues. | 17 | 22 2 58.34 | 9.666 | 11 58 18.2 | 52.53 | 16 13.21 | 66.50 | 14 13.92 | 0.190 | |
| Wed. | 18 | 22 6 49.99 | 9.637 | 11 37 11.9 | 52.99 | 16 13.01 | 66.40 | 14 9.03 | 0.220 | |
| Thur. | 19 | 22 10 40.94 | 9.608 | 11 15 51.8 | +53.43 | 16 12.80 | 66.30 | 14 3.44 | 0.249 | |
| Frid. | 20 | 22 14 31.20 | 9.580 | 10 54 27.2 | 53.86 | 16 12.59 | 66.20 | 13 57.16 | 0.276 | |
| Sat. | 21 | 22 18 20.78 | 9.553 | 10 32 49.5 | 54.27 | 16 12.37 | 66.11 | 13 50.21 | 0.303 | |
| SUN. | 22 | 22 22 9.71 | 9.526 | 10 11 2.2 | +54.66 | 16 12.15 | 66.02 | 13 42.61 | 0.330 | |
| Mon. | 23 | 22 25 58.00 | 9.500 | 9 49 5.7 | 55.04 | 16 11.92 | 65.93 | 13 34.37 | 0.356 | |
| Tues. | 24 | 22 29 45.68 | 9.475 | 9 27 0.3 | 55.40 | 16 11.69 | 65.84 | 13 25.52 | 0.381 | |
| Wed. | 25 | 22 33 32.77 | 9.450 | 9 4 46.4 | +55.75 | 16 11.46 | 65.76 | 13 16.08 | 0.406 | |
| Thur. | 26 | 22 37 19.29 | 9.427 | 8 42 24.4 | 56.08 | 16 11.22 | 65.68 | 13 6.07 | 0.429 | |
| Frid. | 27 | 22 41 5.26 | 9.404 | 8 19 54.7 | 56.40 | 16 10.98 | 65.60 | 12 55.52 | 0.452 | |
| Sat. | 28 | 22 44 50.69 | 9.383 | 7 57 17.6 | 56.70 | 16 10.73 | 65.52 | 12 44.43 | 0.473 | |
| SUN. | 29 | 22 48 35.61 | 9.362 | S. 7 34 33.5 | +56.98 | 16 10.48 | 65.44 | 12 32.82 | 0.494 | |

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.18 from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, to be Subtracted from Mean Time. | Diff. for 1 Hour. | Sidereal Time, or Right Ascension of Mean Sun. |
|------------------|-------------------|--|-------------------|----------------------|-------------------|--|-------------------|--|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination | Diff. for 1 Hour. | | | |
| <i>SUN.</i> | 1 | ^h 20 ^m 59 ^s 25.29 | 10.188 | S. 17° 5' 44".6 | +42.72 | ^m 13 ^s 48.10 | 0.331 | ^h 20 ^m 45 ^s 37.19 |
| <i>Mon.</i> | 2 | 21 3 29.40 | 10.155 | 16 48 30.5 | 43.46 | 13 55.65 | 0.298 | 20 49 33.75 |
| <i>Tues.</i> | 3 | 21 7 32.71 | 10.121 | 16 30 58.6 | 44.19 | 14 2.40 | 0.264 | 20 53 30.31 |
| <i>Wed.</i> | 4 | 21 11 35.22 | 10.088 | 16 13 9.4 | +44.90 | 14 8.35 | 0.231 | 20 57 26.87 |
| <i>Thur.</i> | 5 | 21 15 36.93 | 10.055 | 15 55 3.4 | 45.59 | 14 13.50 | 0.198 | 21 1 23.43 |
| <i>Frid.</i> | 6 | 21 19 37.85 | 10.021 | 15 36 40.9 | 46.27 | 14 17.86 | 0.164 | 21 5 19.99 |
| <i>Sat.</i> | 7 | 21 23 37.96 | 9.988 | 15 18 2.4 | +46.93 | 14 21.42 | 0.131 | 21 9 16.54 |
| <i>SUN.</i> | 8 | 21 27 37.27 | 9.955 | 14 59 8.3 | 47.57 | 14 24.18 | 0.098 | 21 13 13.09 |
| <i>Mon.</i> | 9 | 21 31 35.80 | 9.922 | 14 39 59.0 | 48.19 | 14 26.15 | 0.065 | 21 17 9.65 |
| <i>Tues.</i> | 10 | 21 35 33.54 | 9.889 | 14 20 35.0 | +48.79 | 14 27.34 | 0.032 | 21 21 6.20 |
| <i>Wed.</i> | 11 | 21 39 30.49 | 9.857 | 14 0 56.6 | 49.38 | 14 27.73 | 0.000 | 21 25 2.76 |
| <i>Thur.</i> | 12 | 21 43 26.65 | 9.824 | 13 41 4.4 | 49.95 | 14 27.34 | 0.033 | 21 28 59.31 |
| <i>Frid.</i> | 13 | 21 47 22.04 | 9.792 | 13 20 58.8 | +50.50 | 14 26.17 | 0.065 | 21 32 55.87 |
| <i>Sat.</i> | 14 | 21 51 16.66 | 9.760 | 13 0 40.2 | 51.03 | 14 24.24 | 0.097 | 21 36 52.42 |
| <i>SUN.</i> | 15 | 21 55 10.53 | 9.728 | 12 40 9.0 | 51.55 | 14 21.56 | 0.129 | 21 40 48.97 |
| <i>Mon.</i> | 16 | 21 59 3.66 | 9.697 | 12 19 25.7 | +52.05 | 14 18.13 | 0.160 | 21 44 45.53 |
| <i>Tues.</i> | 17 | 22 2 56.05 | 9.667 | 11 58 30.7 | 52.53 | 14 13.97 | 0.190 | 21 48 42.08 |
| <i>Wed.</i> | 18 | 22 6 47.72 | 9.638 | 11 37 24.4 | 52.99 | 14 9.09 | 0.220 | 21 52 38.63 |
| <i>Thur.</i> | 19 | 22 10 38.69 | 9.609 | 11 16 7.3 | +53.43 | 14 3.50 | 0.249 | 21 56 35.19 |
| <i>Frid.</i> | 20 | 22 14 28.97 | 9.581 | 10 54 39.7 | 53.86 | 13 57.22 | 0.276 | 22 0 31.75 |
| <i>Sat.</i> | 21 | 22 18 18.57 | 9.554 | 10 33 2.0 | 54.27 | 13 50.27 | 0.303 | 22 4 28.30 |
| <i>SUN.</i> | 22 | 22 22 7.53 | 9.527 | 10 11 14.7 | +54.66 | 13 42.67 | 0.330 | 22 8 24.85 |
| <i>Mon.</i> | 23 | 22 25 55.85 | 9.501 | 9 49 18.2 | 55.04 | 13 34.44 | 0.356 | 22 12 21.41 |
| <i>Tues.</i> | 24 | 22 29 43.56 | 9.476 | 9 27 12.7 | 55.40 | 13 25.60 | 0.381 | 22 16 17.96 |
| <i>Wed.</i> | 25 | 22 33 30.68 | 9.451 | 9 4 58.7 | +55.75 | 13 16.16 | 0.406 | 22 20 14.52 |
| <i>Thur.</i> | 26 | 22 37 17.23 | 9.428 | 8 42 36.6 | 56.08 | 13 6.16 | 0.429 | 22 24 11.07 |
| <i>Frid.</i> | 27 | 22 41 3.23 | 9.405 | 8 20 6.8 | 56.40 | 12 55.61 | 0.452 | 22 28 7.62 |
| <i>Sat.</i> | 28 | 22 44 48.69 | 9.384 | 7 57 29.6 | 56.70 | 12 44.52 | 0.473 | 22 32 4.17 |
| <i>SUN.</i> | 29 | 22 48 33.65 | 9.363 | S. 7 34 45.4 | +56.98 | 12 32.92 | 0.494 | 22 36 0.73 |

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 hour,
+ 9".8565,
(Table III.)

| AT GREENWICH MEAN NOON. | | | | | | | | |
|--|------------------|-----------------|------------|----------------------|-----------|--|----------------------|---|
| Day of the Month. | Day of the Year. | THE SUN'S | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 Hour. | Mean Time of Sidereal Noon. |
| | | TRUE LONGITUDE. | | Diff. for 1 Hour. | LATITUDE. | | | |
| | | λ | λ' | | | | | |
| 1 | 32 | 312° 23' 39.5 | 23 50.2 | 152.19 | + 0.32 | 9.9936897 | +28.6 | ^h 3 ^m 13 ^s 50.95 |
| 2 | 33 | 313 24 31.6 | 24 42.1 | 152.15 | 0.20 | 9.9937594 | 29.4 | 3 9 55.04 |
| 3 | 34 | 314 25 22.8 | 25 33.2 | 152.11 | + 0.07 | 9.9938308 | 30.1 | 3 5 59.13 |
| 4 | 35 | 315 26 13.1 | 26 23.4 | 152.07 | — 0.06 | 9.9939038 | +30.8 | 3 2 3.22 |
| 5 | 36 | 316 27 2.4 | 27 12.5 | 152.03 | 0.19 | 9.9939783 | 31.4 | 2 58 7.31 |
| 6 | 37 | 317 27 50.7 | 28 0.6 | 151.99 | 0.31 | 9.9940543 | 31.9 | 2 54 11.41 |
| 7 | 38 | 318 28 37.9 | 28 47.7 | 151.94 | — 0.41 | 9.9941316 | +32.4 | 2 50 15.50 |
| 8 | 39 | 319 29 23.9 | 29 33.6 | 151.89 | 0.48 | 9.9942100 | 32.9 | 2 46 19.59 |
| 9 | 40 | 320 30 8.6 | 30 18.2 | 151.83 | 0.52 | 9.9942894 | 33.3 | 2 42 23.67 |
| 10 | 41 | 321 30 51.9 | 31 1.3 | 151.77 | — 0.54 | 9.9943700 | +33.8 | 2 38 27.76 |
| 11 | 42 | 322 31 33.7 | 31 43.0 | 151.71 | 0.53 | 9.9944518 | 34.3 | 2 34 31.85 |
| 12 | 43 | 323 32 14.0 | 32 23.1 | 151.64 | 0.48 | 9.9945348 | 34.8 | 2 30 35.94 |
| 13 | 44 | 324 32 52.6 | 33 1.6 | 151.57 | — 0.40 | 9.9946189 | +35.3 | 2 26 40.04 |
| 14 | 45 | 325 33 29.5 | 33 38.4 | 151.50 | 0.31 | 9.9947043 | 35.8 | 2 22 44.13 |
| 15 | 46 | 326 34 4.7 | 34 13.4 | 151.43 | 0.20 | 9.9947910 | 36.4 | 2 18 48.22 |
| 16 | 47 | 327 34 38.0 | 34 46.6 | 151.35 | — 0.07 | 9.9948791 | +37.0 | 2 14 52.31 |
| 17 | 48 | 328 35 9.5 | 35 18.0 | 151.27 | + 0.07 | 9.9949688 | 37.7 | 2 10 56.41 |
| 18 | 49 | 329 35 39.2 | 35 47.6 | 151.19 | 0.20 | 9.9950602 | 38.4 | 2 7 0.50 |
| 19 | 50 | 330 36 7.0 | 36 15.3 | 151.12 | + 0.32 | 9.9951533 | +39.1 | 2 3 4.59 |
| 20 | 51 | 331 36 33.0 | 36 41.1 | 151.04 | 0.43 | 9.9952482 | 39.9 | 1 59 8.68 |
| 21 | 52 | 332 36 57.2 | 37 5.2 | 150.97 | 0.52 | 9.9953450 | 40.7 | 1 55 12.77 |
| 22 | 53 | 333 37 19.6 | 37 27.5 | 150.89 | + 0.59 | 9.9954437 | +41.5 | 1 51 16.86 |
| 23 | 54 | 334 37 40.2 | 37 48.0 | 150.82 | 0.62 | 9.9955443 | 42.3 | 1 47 20.95 |
| 24 | 55 | 335 37 59.0 | 38 6.7 | 150.75 | 0.62 | 9.9956469 | 43.1 | 1 43 25.04 |
| 25 | 56 | 336 38 16.2 | 38 23.7 | 150.68 | + 0.60 | 9.9957513 | +43.9 | 1 39 29.14 |
| 26 | 57 | 337 38 31.8 | 38 39.2 | 150.61 | 0.55 | 9.9958575 | 44.6 | 1 35 33.24 |
| 27 | 58 | 338 38 45.9 | 38 53.2 | 150.55 | 0.47 | 9.9959654 | 45.3 | 1 31 37.33 |
| 28 | 59 | 339 38 58.4 | 39 5.6 | 150.49 | 0.37 | 9.9960749 | 45.9 | 1 27 41.42 |
| 29 | 60 | 340 39 9.4 | 39 16.5 | 150.43 | + 0.26 | 9.9961859 | +46.5 | 1 23 45.51 |
| NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^h .0. | | | | | | | | Diff. for 1 Hour, — 9 ^s .8296. (Table II.) |

GREENWICH MEAN TIME.

THE MOON'S

| Day of the Month. | SEMIDIAMETER. | | HORIZONTAL PARALLAX. | | | | UPPER TRANSIT. | | AGE. |
|-------------------|---------------|-----------|----------------------|-------------------|-----------|-------------------|---------------------------|-------------------|--------------|
| | Noon. | Midnight. | Noon. | Diff. for 1 Hour. | Midnight. | Diff. for 1 Hour. | Meridian of Greenwich. | Diff. for 1 Hour. | Noon. |
| | | | | | | | ^h ^m | ^m | ^d |
| 1 | 15' 9.4 | 15' 15.3 | 55' 31.0 | +1.69 | 55' 52.4 | +1.87 | 17 59.7 | 1.92 | 21.9 |
| 2 | 15 21.7 | 15 28.6 | 56 15.9 | 2.04 | 56 41.3 | 2.19 | 18 47.5 | 2.09 | 22.9 |
| 3 | 15 35.9 | 15 43.6 | 57 8.3 | 2.30 | 57 36.5 | 2.39 | 19 39.8 | 2.28 | 23.9 |
| 4 | 15 51.6 | 15 59.6 | 58 5.7 | +2.44 | 58 35.1 | +2.44 | 20 37.1 | 2.47 | 24.9 |
| 5 | 16 7.5 | 16 15.2 | 59 4.3 | 2.39 | 59 32.5 | 2.29 | 21 38.4 | 2.60 | 25.9 |
| 6 | 16 22.4 | 16 28.9 | 59 59.0 | 2.11 | 60 23.1 | 1.88 | 22 42.1 | 2.64 | 26.9 |
| 7 | 16 34.7 | 16 39.4 | 60 44.1 | +1.59 | 61 1.2 | +1.24 | 23 45.3 | 2.57 | 27.9 |
| 8 | 16 42.8 | 16 45.0 | 61 13.9 | 0.86 | 61 21.8 | +0.45 | δ | | 28.9 |
| 9 | 16 45.7 | 16 45.1 | 61 24.6 | +0.02 | 61 22.2 | -0.40 | 0 45.6 | 2.45 | 0.4 |
| 10 | 16 43.1 | 16 39.8 | 61 14.9 | -0.81 | 61 2.8 | -1.18 | 1 42.8 | 2.31 | 1.4 |
| 11 | 16 35.4 | 16 30.0 | 60 46.6 | 1.51 | 60 26.7 | 1.78 | 2 36.4 | 2.18 | 2.4 |
| 12 | 16 23.7 | 16 16.9 | 60 3.9 | 1.99 | 59 38.9 | 2.15 | 3 27.5 | 2.10 | 3.4 |
| 13 | 16 9.7 | 16 2.3 | 59 12.4 | -2.25 | 58 45.0 | -2.30 | 4 17.1 | 2.06 | 4.4 |
| 14 | 15 54.7 | 15 47.3 | 58 17.3 | 2.29 | 57 50.0 | 2.25 | 5 6.5 | 2.07 | 5.4 |
| 15 | 15 39.8 | 15 33.1 | 57 23.4 | 2.17 | 56 58.0 | 2.06 | 5 56.4 | 2.09 | 6.4 |
| 16 | 15 26.6 | 15 20.4 | 56 33.9 | -1.94 | 56 11.4 | -1.81 | 6 47.2 | 2.14 | 7.4 |
| 17 | 15 14.8 | 15 9.6 | 55 50.6 | 1.66 | 55 31.7 | 1.50 | 7 39.0 | 2.16 | 8.4 |
| 18 | 15 5.0 | 15 0.8 | 55 14.6 | 1.35 | 54 59.4 | 1.19 | 8 31.1 | 2.16 | 9.4 |
| 19 | 14 57.2 | 14 54.0 | 54 46.0 | -1.04 | 54 34.4 | -0.90 | 9 22.8 | 2.12 | 10.4 |
| 20 | 14 51.3 | 14 49.1 | 54 24.4 | 0.76 | 54 16.1 | 0.63 | 10 12.9 | 2.05 | 11.4 |
| 21 | 14 47.2 | 14 45.7 | 54 9.3 | 0.51 | 54 3.9 | 0.39 | 11 1.0 | 1.95 | 12.4 |
| 22 | 14 44.7 | 14 44.0 | 54 0.0 | -0.27 | 53 57.4 | -0.16 | 11 46.6 | 1.85 | 13.4 |
| 23 | 14 43.6 | 14 43.6 | 53 56.2 | -0.05 | 53 56.2 | +0.05 | 12 30.0 | 1.77 | 14.4 |
| 24 | 14 44.0 | 14 44.7 | 53 57.5 | +0.16 | 54 0.1 | 0.28 | 13 11.6 | 1.71 | 15.4 |
| 25 | 14 45.8 | 14 47.2 | 54 4.1 | +0.39 | 54 9.4 | +0.50 | 13 52.1 | 1.68 | 16.4 |
| 26 | 14 49.1 | 14 51.3 | 54 16.2 | 0.63 | 54 24.5 | 0.75 | 14 32.5 | 1.69 | 17.4 |
| 27 | 14 54.0 | 14 57.2 | 54 34.3 | 0.89 | 54 45.9 | 1.03 | 15 13.5 | 1.74 | 18.4 |
| 28 | 15 0.8 | 15 4.9 | 54 59.1 | 1.18 | 55 14.2 | 1.33 | 15 56.3 | 1.84 | 19.4 |
| 29 | 15 9.5 | 15 14.6 | 55 31.1 | +1.48 | 55 49.8 | +1.63 | 16 41.9 | 1.97 | 20.4 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-----------|--|---------------------|-----------------|---------------------|--------------|--|---------------------|-----------------|---------------------|
| SUNDAY 1. | | | | | TUESDAY 3. | | | | |
| 0 | ^h 14 ^m 12 ^s 52.19 | 1.9845 | S. 10° 1' 36.5" | 12.348 | 0 | ^h 15 ^m 51 ^s 34.14 | 2.3127 | S. 19° 1' 31.5" | 9.701 |
| 1 | 14 14 47.79 | 1.9889 | 10 13 56.5 | 12.318 | 1 | 15 53 47.12 | 2.3201 | 19 11 11.0 | 9.614 |
| 2 | 14 16 43.66 | 1.9934 | 10 26 14.7 | 12.988 | 2 | 15 56 0.55 | 2.3276 | 19 20 45.2 | 9.526 |
| 3 | 14 18 39.80 | 1.9379 | 10 38 31.1 | 12.357 | 3 | 15 58 14.43 | 2.3351 | 19 30 14.1 | 9.437 |
| 4 | 14 20 36.21 | 1.9425 | 10 50 45.6 | 12.924 | 4 | 16 0 28.76 | 2.3426 | 19 39 37.6 | 9.347 |
| 5 | 14 22 32.90 | 1.9472 | 11 2 58.0 | 12.190 | 5 | 16 2 43.54 | 2.3501 | 19 48 55.7 | 9.255 |
| 6 | 14 24 29.87 | 1.9519 | 11 15 8.4 | 12.156 | 6 | 16 4 58.77 | 2.3577 | 19 58 8.2 | 9.161 |
| 7 | 14 26 27.13 | 1.9567 | 11 27 16.7 | 12.120 | 7 | 16 7 14.46 | 2.3653 | 20 7 15.0 | 9.066 |
| 8 | 14 28 24.68 | 1.9617 | 11 39 22.8 | 12.084 | 8 | 16 9 30.61 | 2.3729 | 20 16 16.1 | 8.970 |
| 9 | 14 30 22.53 | 1.9667 | 11 51 26.8 | 12.047 | 9 | 16 11 47.21 | 2.3805 | 20 25 11.4 | 8.872 |
| 10 | 14 32 20.68 | 1.9718 | 12 3 28.5 | 12.008 | 10 | 16 14 4.27 | 2.3882 | 20 34 0.8 | 8.772 |
| 11 | 14 34 19.14 | 1.9769 | 12 15 27.8 | 11.968 | 11 | 16 16 21.79 | 2.3958 | 20 42 44.1 | 8.671 |
| 12 | 14 36 17.91 | 1.9821 | 12 27 24.7 | 11.928 | 12 | 16 18 39.77 | 2.4035 | 20 51 21.3 | 8.568 |
| 13 | 14 38 16.99 | 1.9873 | 12 39 19.1 | 11.887 | 13 | 16 20 58.21 | 2.4112 | 20 59 52.3 | 8.465 |
| 14 | 14 40 16.39 | 1.9927 | 12 51 11.1 | 11.845 | 14 | 16 23 17.12 | 2.4190 | 21 8 17.1 | 8.359 |
| 15 | 14 42 16.11 | 1.9981 | 13 3 0.5 | 11.801 | 15 | 16 25 36.49 | 2.4267 | 21 16 35.4 | 8.251 |
| 16 | 14 44 16.16 | 2.0036 | 13 14 47.2 | 11.756 | 16 | 16 27 56.33 | 2.4345 | 21 24 47.2 | 8.142 |
| 17 | 14 46 16.54 | 2.0091 | 13 26 31.2 | 11.711 | 17 | 16 30 16.63 | 2.4422 | 21 32 52.5 | 8.032 |
| 18 | 14 48 17.25 | 2.0147 | 13 38 12.5 | 11.664 | 18 | 16 32 37.39 | 2.4499 | 21 40 51.1 | 7.921 |
| 19 | 14 50 18.30 | 2.0204 | 13 49 50.9 | 11.616 | 19 | 16 34 58.62 | 2.4577 | 21 48 43.0 | 7.807 |
| 20 | 14 52 19.70 | 2.0262 | 14 1 26.4 | 11.567 | 20 | 16 37 20.31 | 2.4654 | 21 56 28.0 | 7.692 |
| 21 | 14 54 21.45 | 2.0321 | 14 12 59.0 | 11.517 | 21 | 16 39 42.47 | 2.4731 | 22 4 6.0 | 7.575 |
| 22 | 14 56 23.55 | 2.0379 | 14 24 28.5 | 11.466 | 22 | 16 42 5.09 | 2.4808 | 22 11 37.0 | 7.457 |
| 23 | 14 58 26.00 | 2.0438 | S. 14 35 54.9 | 11.413 | 23 | 16 44 28.17 | 2.4886 | S. 22 19 0.9 | 7.337 |
| MONDAY 2. | | | | | WEDNESDAY 4. | | | | |
| 0 | 15 0 28.81 | 2.0499 | S. 14 47 18.1 | 11.359 | 0 | 16 46 51.72 | 2.4963 | S. 22 26 17.5 | 7.216 |
| 1 | 15 2 31.99 | 2.0561 | 14 58 38.0 | 11.305 | 1 | 16 49 15.73 | 2.4040 | 22 33 26.8 | 7.093 |
| 2 | 15 4 35.54 | 2.0622 | 15 9 54.7 | 11.250 | 2 | 16 51 40.20 | 2.4116 | 22 40 28.7 | 6.969 |
| 3 | 15 6 39.46 | 2.0684 | 15 21 8.0 | 11.192 | 3 | 16 54 5.12 | 2.4192 | 22 47 23.1 | 6.843 |
| 4 | 15 8 43.75 | 2.0747 | 15 32 17.8 | 11.134 | 4 | 16 56 30.50 | 2.4268 | 22 54 9.9 | 6.715 |
| 5 | 15 10 48.43 | 2.0812 | 15 43 24.1 | 11.075 | 5 | 16 58 56.34 | 2.4344 | 23 0 48.9 | 6.585 |
| 6 | 15 12 53.49 | 2.0876 | 15 54 26.8 | 11.014 | 6 | 17 1 22.63 | 2.4419 | 23 7 20.1 | 6.454 |
| 7 | 15 14 58.94 | 2.0941 | 16 5 25.8 | 10.952 | 7 | 17 3 49.37 | 2.4494 | 23 13 43.4 | 6.322 |
| 8 | 15 17 4.78 | 2.1006 | 16 16 21.1 | 10.889 | 8 | 17 6 16.56 | 2.4569 | 23 19 58.7 | 6.188 |
| 9 | 15 19 11.01 | 2.1072 | 16 27 12.5 | 10.824 | 9 | 17 8 44.20 | 2.4643 | 23 26 6.0 | 6.053 |
| 10 | 15 21 17.64 | 2.1138 | 16 38 0.0 | 10.758 | 10 | 17 11 12.28 | 2.4716 | 23 32 5.1 | 5.916 |
| 11 | 15 23 24.67 | 2.1206 | 16 48 43.5 | 10.692 | 11 | 17 13 40.80 | 2.4789 | 23 37 55.9 | 5.777 |
| 12 | 15 25 32.11 | 2.1274 | 16 59 23.0 | 10.624 | 12 | 17 16 9.75 | 2.4862 | 23 43 38.3 | 5.636 |
| 13 | 15 27 39.96 | 2.1342 | 17 9 58.4 | 10.555 | 13 | 17 18 39.14 | 2.4934 | 23 49 12.2 | 5.494 |
| 14 | 15 29 48.22 | 2.1411 | 17 20 29.6 | 10.484 | 14 | 17 21 8.96 | 2.5006 | 23 54 37.6 | 5.352 |
| 15 | 15 31 56.89 | 2.1480 | 17 30 56.5 | 10.412 | 15 | 17 23 39.21 | 2.5077 | 23 59 54.4 | 5.207 |
| 16 | 15 34 5.98 | 2.1551 | 17 41 19.0 | 10.338 | 16 | 17 26 9.88 | 2.5147 | 24 5 2.5 | 5.061 |
| 17 | 15 36 15.50 | 2.1622 | 17 51 37.0 | 10.262 | 17 | 17 28 40.97 | 2.5217 | 24 10 1.7 | 4.912 |
| 18 | 15 38 25.44 | 2.1692 | 18 1 50.4 | 10.185 | 18 | 17 31 12.48 | 2.5286 | 24 14 52.0 | 4.763 |
| 19 | 15 40 35.80 | 2.1764 | 18 11 59.2 | 10.108 | 19 | 17 33 44.40 | 2.5353 | 24 19 33.3 | 4.613 |
| 20 | 15 42 46.60 | 2.1836 | 18 22 3.4 | 10.030 | 20 | 17 36 16.72 | 2.5420 | 24 24 5.5 | 4.461 |
| 21 | 15 44 57.83 | 2.1908 | 18 32 2.8 | 9.949 | 21 | 17 38 49.44 | 2.5487 | 24 28 28.6 | 4.307 |
| 22 | 15 47 9.50 | 2.1981 | 18 41 57.3 | 9.867 | 22 | 17 41 22.56 | 2.5552 | 24 32 42.4 | 4.152 |
| 23 | 15 49 21.60 | 2.2054 | 18 51 46.9 | 9.785 | 23 | 17 43 56.07 | 2.5617 | 24 36 46.8 | 3.995 |
| 24 | 15 51 34.14 | 2.2127 | S. 19 1 31.5 | 9.701 | 24 | 17 46 29.96 | 2.5680 | S. 24 40 41.8 | 3.837 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|---------------------|------------------|---------------------|-------------|------------------|---------------------|------------------|---------------------|
| THURSDAY 5. | | | | | SATURDAY 7. | | | | |
| 0 | 17 46 29.96 | 2.5680 | S. 24° 40' 41.8" | 3.837 | 0 | 19 54 37.68 | 2.7119 | S. 24° 23' 21.6" | 4.788 |
| 1 | 17 49 4.23 | 2.5743 | 24 44 27.3 | 3.878 | 1 | 19 57 20.33 | 2.7102 | 24 18 28.8 | 4.973 |
| 2 | 17 51 38.88 | 2.5805 | 24 48 3.2 | 3.518 | 2 | 20 0 2.91 | 2.7091 | 24 13 24.9 | 5.158 |
| 3 | 17 54 13.89 | 2.5865 | 24 51 29.4 | 3.356 | 3 | 20 2 45.42 | 2.7077 | 24 8 9.9 | 5.343 |
| 4 | 17 56 49.26 | 2.5925 | 24 54 45.9 | 3.192 | 4 | 20 5 27.84 | 2.7069 | 24 2 43.8 | 5.526 |
| 5 | 17 59 24.99 | 2.5983 | 24 57 52.5 | 3.027 | 5 | 20 8 10.17 | 2.7047 | 23 57 6.8 | 5.708 |
| 6 | 18 2 1.06 | 2.6040 | 25 0 49.2 | 2.862 | 6 | 20 10 52.40 | 2.7029 | 23 51 18.8 | 5.891 |
| 7 | 18 4 37.47 | 2.6097 | 25 3 35.9 | 2.695 | 7 | 20 13 34.52 | 2.7009 | 23 45 19.9 | 6.073 |
| 8 | 18 7 14.22 | 2.6152 | 25 6 12.6 | 2.527 | 8 | 20 16 16.51 | 2.6987 | 23 39 10.0 | 6.255 |
| 9 | 18 9 51.29 | 2.6205 | 25 8 39.2 | 2.358 | 9 | 20 18 58.37 | 2.6965 | 23 32 49.3 | 6.434 |
| 10 | 18 12 28.68 | 2.6257 | 25 10 55.6 | 2.187 | 10 | 20 21 40.09 | 2.6942 | 23 26 17.9 | 6.613 |
| 11 | 18 15 6.38 | 2.6309 | 25 13 1.7 | 2.016 | 11 | 20 24 21.67 | 2.6917 | 23 19 35.7 | 6.792 |
| 12 | 18 17 44.39 | 2.6360 | 25 14 57.5 | 1.843 | 12 | 20 27 3.09 | 2.6889 | 23 12 42.8 | 6.970 |
| 13 | 18 20 22.70 | 2.6408 | 25 16 42.9 | 1.669 | 13 | 20 29 44.34 | 2.6861 | 23 5 39.3 | 7.146 |
| 14 | 18 23 1.29 | 2.6454 | 25 18 17.8 | 1.494 | 14 | 20 32 25.42 | 2.6832 | 22 58 25.3 | 7.321 |
| 15 | 18 25 40.15 | 2.6499 | 25 19 42.2 | 1.318 | 15 | 20 35 6.32 | 2.6801 | 22 51 0.8 | 7.495 |
| 16 | 18 28 19.28 | 2.6544 | 25 20 56.0 | 1.142 | 16 | 20 37 47.03 | 2.6768 | 22 43 25.9 | 7.668 |
| 17 | 18 30 58.68 | 2.6587 | 25 21 59.2 | 0.964 | 17 | 20 40 27.54 | 2.6735 | 22 35 40.6 | 7.840 |
| 18 | 18 33 38.33 | 2.6628 | 25 22 51.7 | 0.785 | 18 | 20 43 7.85 | 2.6701 | 22 27 45.1 | 8.010 |
| 19 | 18 36 18.22 | 2.6668 | 25 23 33.4 | 0.606 | 19 | 20 45 47.95 | 2.6665 | 22 19 39.4 | 8.180 |
| 20 | 18 38 58.35 | 2.6707 | 25 24 4.4 | 0.427 | 20 | 20 48 27.83 | 2.6627 | 22 11 23.5 | 8.349 |
| 21 | 18 41 38.70 | 2.6743 | 25 24 24.6 | 0.246 | 21 | 20 51 7.48 | 2.6589 | 22 2 57.5 | 8.516 |
| 22 | 18 44 19.27 | 2.6779 | 25 24 33.9 | - 0.063 | 22 | 20 53 46.90 | 2.6550 | 21 54 21.6 | 8.681 |
| 23 | 18 47 0.05 | 2.6812 | S. 25 24 32.2 | + 0.120 | 23 | 20 56 26.08 | 2.6509 | S. 21 45 35.8 | 8.844 |
| FRIDAY 6. | | | | | SUNDAY 8. | | | | |
| 0 | 18 49 41.02 | 2.6844 | S. 25 24 19.5 | 0.303 | 0 | 20 59 5.01 | 2.6467 | S. 21 36 40.3 | 9.006 |
| 1 | 18 52 22.18 | 2.6875 | 25 23 55.8 | 0.487 | 1 | 21 1 43.69 | 2.6425 | 21 27 35.1 | 9.167 |
| 2 | 18 55 3.52 | 2.6904 | 25 23 21.1 | 0.671 | 2 | 21 4 22.11 | 2.6382 | 21 18 20.2 | 9.328 |
| 3 | 18 57 45.03 | 2.6932 | 25 22 35.3 | 0.856 | 3 | 21 7 0.27 | 2.6337 | 21 8 55.7 | 9.487 |
| 4 | 19 0 26.70 | 2.6957 | 25 21 38.4 | 1.042 | 4 | 21 9 38.16 | 2.6292 | 20 59 21.8 | 9.643 |
| 5 | 19 3 8.51 | 2.6980 | 25 20 30.3 | 1.227 | 5 | 21 12 15.78 | 2.6246 | 20 49 38.6 | 9.797 |
| 6 | 19 5 50.46 | 2.7002 | 25 19 11.1 | 1.413 | 6 | 21 14 53.11 | 2.6199 | 20 39 46.2 | 9.950 |
| 7 | 19 8 32.54 | 2.7023 | 25 17 40.7 | 1.600 | 7 | 21 17 30.16 | 2.6151 | 20 29 44.6 | 10.102 |
| 8 | 19 11 14.74 | 2.7042 | 25 15 59.1 | 1.787 | 8 | 21 20 6.92 | 2.6102 | 20 19 34.0 | 10.252 |
| 9 | 19 13 57.05 | 2.7060 | 25 14 6.2 | 1.975 | 9 | 21 22 43.38 | 2.6052 | 20 9 14.4 | 10.400 |
| 10 | 19 16 39.46 | 2.7075 | 25 12 2.1 | 2.162 | 10 | 21 25 19.54 | 2.6002 | 19 58 46.0 | 10.546 |
| 11 | 19 19 21.95 | 2.7088 | 25 9 46.7 | 2.350 | 11 | 21 27 55.40 | 2.5952 | 19 48 8.9 | 10.691 |
| 12 | 19 22 4.52 | 2.7101 | 25 7 20.1 | 2.538 | 12 | 21 30 30.96 | 2.5900 | 19 37 23.1 | 10.834 |
| 13 | 19 24 47.16 | 2.7112 | 25 4 42.2 | 2.726 | 13 | 21 33 6.20 | 2.5848 | 19 26 28.8 | 10.975 |
| 14 | 19 27 29.86 | 2.7120 | 25 1 53.0 | 2.914 | 14 | 21 35 41.13 | 2.5795 | 19 15 26.1 | 11.114 |
| 15 | 19 30 12.60 | 2.7127 | 24 58 52.5 | 3.102 | 15 | 21 38 15.74 | 2.5741 | 19 4 15.1 | 11.252 |
| 16 | 19 32 55.38 | 2.7132 | 24 55 40.7 | 3.290 | 16 | 21 40 50.02 | 2.5687 | 18 52 55.9 | 11.387 |
| 17 | 19 35 38.18 | 2.7135 | 24 52 17.7 | 3.478 | 17 | 21 43 23.98 | 2.5632 | 18 41 28.7 | 11.520 |
| 18 | 19 38 21.00 | 2.7137 | 24 48 43.4 | 3.666 | 18 | 21 45 57.61 | 2.5577 | 18 29 53.5 | 11.652 |
| 19 | 19 41 3.82 | 2.7137 | 24 44 57.8 | 3.853 | 19 | 21 48 30.91 | 2.5522 | 18 18 10.5 | 11.782 |
| 20 | 19 43 46.64 | 2.7136 | 24 41 1.0 | 4.040 | 20 | 21 51 3.88 | 2.5467 | 18 6 19.7 | 11.910 |
| 21 | 19 46 29.45 | 2.7132 | 24 36 53.0 | 4.228 | 21 | 21 53 36.51 | 2.5411 | 17 54 21.3 | 12.036 |
| 22 | 19 49 12.23 | 2.7127 | 24 32 33.7 | 4.415 | 22 | 21 56 8.81 | 2.5355 | 17 42 15.4 | 12.159 |
| 23 | 19 51 54.98 | 2.7121 | 24 28 3.2 | 4.601 | 23 | 21 58 40.77 | 2.5298 | 17 30 2.2 | 12.281 |
| 24 | 19 54 37.68 | 2.7112 | S. 24 23 21.6 | 4.788 | 24 | 22 1 12.39 | 2.5242 | S. 17 17 41.7 | 12.401 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|---|---------------------|------------------|---------------------|---------------|--|---------------------|-----------------|---------------------|
| MONDAY 9. | | | | | WEDNESDAY 11. | | | | |
| 0 | ^h 22 ^m 1 ^s 12.30 | 2.5949 | S. 17° 17' 41.7" | 12.401 | 0 | ^h 23 ^m 55 ^s 58.53 | 2.9711 | S. 5° 44' 17.4" | 15.699 |
| 1 | 22 3 43.67 | 2.5185 | 17 5 14.1 | 12.518 | 1 | 23 58 14.67 | 2.9670 | 5 28 35.3 | 15.711 |
| 2 | 22 6 14.61 | 2.5127 | 16 52 39.5 | 12.634 | 2 | 0 0 30.57 | 2.9631 | 5 12 52.1 | 15.727 |
| 3 | 22 8 45.20 | 2.5070 | 16 39 58.0 | 12.747 | 3 | 0 2 46.24 | 2.9592 | 4 57 8.0 | 15.749 |
| 4 | 22 11 15.45 | 2.5012 | 16 27 9.8 | 12.859 | 4 | 0 5 1.67 | 2.9552 | 4 41 23.0 | 15.756 |
| 5 | 22 13 45.35 | 2.4954 | 16 14 14.9 | 12.969 | 5 | 0 7 16.86 | 2.9513 | 4 25 37.3 | 15.767 |
| 6 | 22 16 14.90 | 2.4897 | 16 1 13.5 | 13.077 | 6 | 0 9 31.82 | 2.9475 | 4 9 50.9 | 15.777 |
| 7 | 22 18 44.11 | 2.4839 | 15 48 5.7 | 13.182 | 7 | 0 11 46.56 | 2.9438 | 3 54 4.0 | 15.785 |
| 8 | 22 21 12.97 | 2.4781 | 15 34 51.7 | 13.284 | 8 | 0 14 1.08 | 2.9402 | 3 38 16.7 | 15.791 |
| 9 | 22 23 41.48 | 2.4723 | 15 21 31.6 | 13.385 | 9 | 0 16 15.39 | 2.9367 | 3 22 29.1 | 15.795 |
| 10 | 22 26 9.65 | 2.4666 | 15 8 5.5 | 13.484 | 10 | 0 18 29.49 | 2.9332 | 3 6 41.3 | 15.797 |
| 11 | 22 28 37.47 | 2.4608 | 14 54 33.5 | 13.582 | 11 | 0 20 43.38 | 2.9298 | 2 50 53.4 | 15.799 |
| 12 | 22 31 4.95 | 2.4551 | 14 40 55.7 | 13.677 | 12 | 0 22 57.07 | 2.9265 | 2 35 5.4 | 15.798 |
| 13 | 22 33 32.08 | 2.4493 | 14 27 12.3 | 13.769 | 13 | 0 25 10.56 | 2.9232 | 2 19 17.6 | 15.795 |
| 14 | 22 35 58.87 | 2.4436 | 14 13 23.4 | 13.859 | 14 | 0 27 23.86 | 2.9201 | 2 3 30.0 | 15.791 |
| 15 | 22 38 25.31 | 2.4379 | 13 59 29.2 | 13.947 | 15 | 0 29 36.97 | 2.9170 | 1 47 42.7 | 15.785 |
| 16 | 22 40 51.41 | 2.4322 | 13 45 29.7 | 14.033 | 16 | 0 31 49.90 | 2.9140 | 1 31 55.8 | 15.777 |
| 17 | 22 43 17.17 | 2.4265 | 13 31 25.2 | 14.117 | 17 | 0 34 2.65 | 2.9110 | 1 16 9.5 | 15.767 |
| 18 | 22 45 42.59 | 2.4208 | 13 17 15.7 | 14.199 | 18 | 0 36 15.22 | 2.9081 | 1 0 23.8 | 15.756 |
| 19 | 22 48 7.67 | 2.4152 | 13 3 1.3 | 14.279 | 19 | 0 38 27.62 | 2.9052 | 0 44 38.8 | 15.743 |
| 20 | 22 50 32.42 | 2.4096 | 12 48 42.2 | 14.357 | 20 | 0 40 39.85 | 2.9025 | 0 28 54.6 | 15.729 |
| 21 | 22 52 56.83 | 2.4040 | 12 34 18.5 | 14.432 | 21 | 0 42 51.92 | 2.1998 | S. 0 13 11.3 | 15.713 |
| 22 | 22 55 20.90 | 2.3985 | 12 19 50.3 | 14.506 | 22 | 0 45 3.83 | 2.1972 | N. 0 2 31.0 | 15.696 |
| 23 | 22 57 44.65 | 2.3931 | S. 12 5 17.8 | 14.577 | 23 | 0 47 15.59 | 2.1947 | N. 0 18 12.2 | 15.677 |
| TUESDAY 10. | | | | | THURSDAY 12. | | | | |
| 0 | 23 0 8.07 | 2.3876 | S. 11 50 41.0 | 14.647 | 0 | 0 49 27.20 | 2.1922 | N. 0 33 52.2 | 15.656 |
| 1 | 23 2 31.16 | 2.3822 | 11 36 0.2 | 14.714 | 1 | 0 51 38.66 | 2.1899 | 0 49 30.9 | 15.634 |
| 2 | 23 4 53.93 | 2.3768 | 11 21 15.4 | 14.779 | 2 | 0 53 49.99 | 2.1877 | 1 5 8.3 | 15.611 |
| 3 | 23 7 16.37 | 2.3714 | 11 6 26.7 | 14.849 | 3 | 0 56 1.18 | 2.1854 | 1 20 44.2 | 15.586 |
| 4 | 23 9 38.50 | 2.3661 | 10 51 34.3 | 14.902 | 4 | 0 58 12.24 | 2.1832 | 1 36 18.5 | 15.558 |
| 5 | 23 12 0.31 | 2.3608 | 10 36 38.4 | 14.961 | 5 | 1 0 23.17 | 2.1812 | 1 51 51.2 | 15.530 |
| 6 | 23 14 21.80 | 2.3556 | 10 21 39.0 | 15.018 | 6 | 1 2 33.98 | 2.1792 | 2 7 22.1 | 15.500 |
| 7 | 23 16 42.98 | 2.3504 | 10 6 36.3 | 15.073 | 7 | 1 4 44.67 | 2.1772 | 2 22 51.2 | 15.470 |
| 8 | 23 19 3.85 | 2.3453 | 9 51 30.3 | 15.126 | 8 | 1 6 55.24 | 2.1753 | 2 38 18.5 | 15.437 |
| 9 | 23 21 24.42 | 2.3402 | 9 36 21.2 | 15.176 | 9 | 1 9 5.70 | 2.1735 | 2 53 43.7 | 15.402 |
| 10 | 23 23 44.68 | 2.3352 | 9 21 9.2 | 15.223 | 10 | 1 11 16.06 | 2.1718 | 3 9 6.8 | 15.367 |
| 11 | 23 26 4.65 | 2.3303 | 9 5 54.4 | 15.270 | 11 | 1 13 26.32 | 2.1702 | 3 24 27.8 | 15.331 |
| 12 | 23 28 24.32 | 2.3254 | 8 50 36.8 | 15.315 | 12 | 1 15 36.48 | 2.1686 | 3 39 46.5 | 15.293 |
| 13 | 23 30 43.70 | 2.3206 | 8 35 16.6 | 15.357 | 13 | 1 17 46.55 | 2.1671 | 3 55 2.9 | 15.253 |
| 14 | 23 33 2.79 | 2.3158 | 8 19 54.0 | 15.397 | 14 | 1 19 56.53 | 2.1657 | 4 10 16.9 | 15.212 |
| 15 | 23 35 21.59 | 2.3110 | 8 4 29.0 | 15.435 | 15 | 1 22 6.43 | 2.1643 | 4 25 28.4 | 15.170 |
| 16 | 23 37 40.11 | 2.3063 | 7 49 1.8 | 15.472 | 16 | 1 24 16.24 | 2.1629 | 4 40 37.3 | 15.126 |
| 17 | 23 39 58.35 | 2.3017 | 7 33 32.4 | 15.506 | 17 | 1 26 25.98 | 2.1617 | 4 55 43.5 | 15.080 |
| 18 | 23 42 16.31 | 2.2971 | 7 18 1.0 | 15.538 | 18 | 1 28 35.65 | 2.1606 | 5 10 46.9 | 15.034 |
| 19 | 23 44 34.00 | 2.2926 | 7 2 27.8 | 15.568 | 19 | 1 30 45.25 | 2.1595 | 5 25 47.5 | 14.987 |
| 20 | 23 46 51.43 | 2.2882 | 6 46 52.8 | 15.597 | 20 | 1 32 54.79 | 2.1585 | 5 40 45.3 | 14.938 |
| 21 | 23 49 8.59 | 2.2838 | 6 31 16.1 | 15.624 | 21 | 1 35 4.27 | 2.1576 | 5 55 40.1 | 14.888 |
| 22 | 23 51 25.49 | 2.2796 | 6 15 37.9 | 15.648 | 22 | 1 37 13.70 | 2.1567 | 6 10 31.9 | 14.837 |
| 23 | 23 53 42.14 | 2.2753 | 5 59 58.3 | 15.671 | 23 | 1 39 23.07 | 2.1558 | 6 25 20.5 | 14.783 |
| 24 | 23 55 58.53 | 2.2711 | S. 5 44 17.4 | 15.692 | 24 | 1 41 32.39 | 2.1550 | N. 6 40 5.9 | 14.729 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|------------------|---------------------|------------|------------------|---------------------|------------------|---------------------|
| FRIDAY 13. | | | | | SUNDAY 15. | | | | |
| 0 | 1 41 32.39 | 2.1550 | N. 6° 40' 5.9" | 14.729 | 0 | 3 25 11.61 | 2.1817 | N. 17° 4' 13.4" | 10.909 |
| 1 | 1 43 41.67 | 2.1543 | 6 54 48.0 | 14.674 | 1 | 3 27 22.55 | 2.1831 | 17 15 4.5 | 10.801 |
| 2 | 1 45 50.91 | 2.1537 | 7 9 26.8 | 14.618 | 2 | 3 29 33.58 | 2.1847 | 17 25 49.5 | 10.698 |
| 3 | 1 48 0.12 | 2.1539 | 7 24 2.2 | 14.561 | 3 | 3 31 44.71 | 2.1862 | 17 36 28.3 | 10.595 |
| 4 | 1 50 9.29 | 2.1527 | 7 38 34.1 | 14.509 | 4 | 3 33 55.93 | 2.1877 | 17 47 0.9 | 10.491 |
| 5 | 1 52 18.44 | 2.1529 | 7 53 2.5 | 14.449 | 5 | 3 36 7.24 | 2.1899 | 17 57 27.2 | 10.387 |
| 6 | 1 54 27.56 | 2.1519 | 8 7 27.2 | 14.381 | 6 | 3 38 18.64 | 2.1908 | 18 7 47.3 | 10.282 |
| 7 | 1 56 36.66 | 2.1516 | 8 21 48.2 | 14.319 | 7 | 3 40 30.14 | 2.1994 | 18 18 1.0 | 10.175 |
| 8 | 1 58 45.75 | 2.1513 | 8 36 5.5 | 14.256 | 8 | 3 42 41.73 | 2.1940 | 18 28 8.3 | 10.069 |
| 9 | 2 0 54.82 | 2.1511 | 8 50 18.9 | 14.191 | 9 | 3 44 53.42 | 2.1957 | 18 38 9.3 | 9.969 |
| 10 | 2 3 3.88 | 2.1510 | 9 4 28.4 | 14.126 | 10 | 3 47 5.21 | 2.1973 | 18 48 3.8 | 9.854 |
| 11 | 2 5 12.94 | 2.1509 | 9 18 34.0 | 14.059 | 11 | 3 49 17.10 | 2.1989 | 18 57 51.8 | 9.745 |
| 12 | 2 7 21.99 | 2.1508 | 9 32 35.5 | 13.991 | 12 | 3 51 29.08 | 2.2005 | 19 7 33.2 | 9.635 |
| 13 | 2 9 31.04 | 2.1509 | 9 46 32.9 | 13.922 | 13 | 3 53 41.16 | 2.2029 | 19 17 8.0 | 9.525 |
| 14 | 2 11 40.10 | 2.1511 | 10 0 26.2 | 13.852 | 14 | 3 55 53.34 | 2.2038 | 19 26 36.2 | 9.415 |
| 15 | 2 13 49.17 | 2.1519 | 10 14 15.2 | 13.781 | 15 | 3 58 5.62 | 2.2055 | 19 35 57.8 | 9.304 |
| 16 | 2 15 58.25 | 2.1514 | 10 27 59.9 | 13.709 | 16 | 4 0 18.00 | 2.2071 | 19 45 12.7 | 9.192 |
| 17 | 2 18 7.34 | 2.1517 | 10 41 40.3 | 13.636 | 17 | 4 2 30.47 | 2.2087 | 19 54 20.8 | 9.079 |
| 18 | 2 20 16.45 | 2.1520 | 10 55 16.2 | 13.561 | 18 | 4 4 43.04 | 2.2103 | 20 3 22.2 | 8.966 |
| 19 | 2 22 25.58 | 2.1523 | 11 8 47.6 | 13.486 | 19 | 4 6 55.71 | 2.2120 | 20 12 16.8 | 8.852 |
| 20 | 2 24 34.73 | 2.1527 | 11 22 14.5 | 13.411 | 20 | 4 9 8.48 | 2.2137 | 20 21 4.5 | 8.737 |
| 21 | 2 26 43.91 | 2.1539 | 11 35 36.9 | 13.334 | 21 | 4 11 21.35 | 2.2153 | 20 29 45.3 | 8.622 |
| 22 | 2 28 53.12 | 2.1537 | 11 48 54.6 | 13.255 | 22 | 4 13 34.32 | 2.2169 | 20 38 19.2 | 8.507 |
| 23 | 2 31 2.36 | 2.1543 | N. 12° 2' 7.5" | 13.175 | 23 | 4 15 47.38 | 2.2185 | N. 20° 46' 46.1" | 8.391 |
| SATURDAY 14. | | | | | MONDAY 16. | | | | |
| 0 | 2 33 11.64 | 2.1550 | N. 12° 15' 15.6" | 13.095 | 0 | 4 18 0.54 | 2.2201 | N. 20° 55' 6.1" | 8.275 |
| 1 | 2 35 20.96 | 2.1557 | 12 28 18.9 | 13.014 | 1 | 4 20 13.79 | 2.2217 | 21 3 19.1 | 8.157 |
| 2 | 2 37 30.32 | 2.1564 | 12 41 17.3 | 12.938 | 2 | 4 22 27.14 | 2.2233 | 21 11 25.0 | 8.039 |
| 3 | 2 39 39.72 | 2.1571 | 12 54 10.7 | 12.849 | 3 | 4 24 40.59 | 2.2249 | 21 19 23.8 | 7.921 |
| 4 | 2 41 49.17 | 2.1579 | 13 6 59.1 | 12.765 | 4 | 4 26 54.13 | 2.2264 | 21 27 15.6 | 7.803 |
| 5 | 2 43 58.67 | 2.1588 | 13 19 42.5 | 12.681 | 5 | 4 29 7.76 | 2.2280 | 21 35 0.2 | 7.683 |
| 6 | 2 46 8.22 | 2.1597 | 13 32 20.8 | 12.595 | 6 | 4 31 21.49 | 2.2296 | 21 42 37.6 | 7.563 |
| 7 | 2 48 17.83 | 2.1606 | 13 44 53.9 | 12.508 | 7 | 4 33 35.31 | 2.2310 | 21 50 7.8 | 7.443 |
| 8 | 2 50 27.49 | 2.1615 | 13 57 21.7 | 12.420 | 8 | 4 35 49.21 | 2.2324 | 21 57 30.8 | 7.322 |
| 9 | 2 52 37.21 | 2.1626 | 14 9 44.3 | 12.332 | 9 | 4 38 3.20 | 2.2339 | 22 4 46.5 | 7.201 |
| 10 | 2 54 47.00 | 2.1637 | 14 22 1.5 | 12.242 | 10 | 4 40 17.28 | 2.2354 | 22 11 54.9 | 7.079 |
| 11 | 2 56 56.85 | 2.1647 | 14 34 13.3 | 12.152 | 11 | 4 42 31.45 | 2.2368 | 22 18 56.0 | 6.957 |
| 12 | 2 59 6.76 | 2.1658 | 14 46 19.7 | 12.061 | 12 | 4 44 45.70 | 2.2382 | 22 25 49.8 | 6.835 |
| 13 | 3 1 16.74 | 2.1669 | 14 58 20.6 | 11.968 | 13 | 4 47 0.03 | 2.2395 | 22 32 36.2 | 6.712 |
| 14 | 3 3 26.79 | 2.1680 | 15 10 15.9 | 11.875 | 14 | 4 49 14.44 | 2.2409 | 22 39 15.2 | 6.588 |
| 15 | 3 5 36.92 | 2.1694 | 15 22 5.6 | 11.782 | 15 | 4 51 28.94 | 2.2422 | 22 45 46.8 | 6.465 |
| 16 | 3 7 47.12 | 2.1707 | 15 33 49.7 | 11.688 | 16 | 4 53 43.51 | 2.2435 | 22 52 11.0 | 6.341 |
| 17 | 3 9 57.40 | 2.1719 | 15 45 28.1 | 11.593 | 17 | 4 55 58.16 | 2.2447 | 22 58 27.7 | 6.216 |
| 18 | 3 12 7.75 | 2.1732 | 15 57 0.8 | 11.497 | 18 | 4 58 12.88 | 2.2459 | 23 4 36.9 | 6.091 |
| 19 | 3 14 18.18 | 2.1746 | 16 8 27.7 | 11.399 | 19 | 5 0 27.67 | 2.2471 | 23 10 38.6 | 5.966 |
| 20 | 3 16 28.70 | 2.1760 | 16 19 48.7 | 11.301 | 20 | 5 2 42.53 | 2.2482 | 23 16 32.8 | 5.840 |
| 21 | 3 18 39.30 | 2.1773 | 16 31 3.8 | 11.209 | 21 | 5 4 57.46 | 2.2493 | 23 22 19.4 | 5.713 |
| 22 | 3 20 49.98 | 2.1787 | 16 42 13.0 | 11.103 | 22 | 5 7 12.45 | 2.2503 | 23 27 58.4 | 5.587 |
| 23 | 3 23 0.75 | 2.1809 | 16 53 16.2 | 11.003 | 23 | 5 9 27.50 | 2.2514 | 23 33 29.8 | 5.461 |
| 24 | 3 25 11.61 | 2.1817 | N. 17° 4' 13.4" | 10.909 | 24 | 5 11 42.62 | 2.2524 | N. 23° 38' 53.7" | 5.334 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|------------------|---------------------|---------------|---------------------|--------------|------------------|---------------------|---------------|---------------------|
| TUESDAY 17. | | | | | THURSDAY 19. | | | | |
| 0 | h m s | s | N. 23 38 53.7 | 5.334 | 0 | h m s | s | N. 25 25 44.0 | 0.880 |
| 1 | 5 13 42.62 | 2.2524 | 23 44 9.9 | 5.306 | 1 | 6 59 59.60 | 2.2370 | 25 24 47.4 | 1.007 |
| 2 | 5 16 13.02 | 2.2542 | 23 49 18.4 | 5.078 | 2 | 7 2 13.77 | 2.2359 | 25 23 43.2 | 1.133 |
| 3 | 5 18 28.30 | 2.2551 | 23 54 19.3 | 4.951 | 3 | 7 4 27.83 | 2.2334 | 25 22 31.4 | 1.259 |
| 4 | 5 20 43.63 | 2.2559 | 23 59 12.5 | 4.823 | 4 | 7 6 41.78 | 2.2315 | 25 21 12.1 | 1.385 |
| 5 | 5 22 59.01 | 2.2567 | 24 3 58.0 | 4.695 | 5 | 7 8 55.61 | 2.2295 | 25 19 45.2 | 1.511 |
| 6 | 5 25 14.44 | 2.2575 | 24 8 35.9 | 4.567 | 6 | 7 11 9.32 | 2.2274 | 25 18 10.8 | 1.635 |
| 7 | 5 27 29.91 | 2.2582 | 24 13 6.0 | 4.438 | 7 | 7 13 22.90 | 2.2253 | 25 16 29.0 | 1.759 |
| 8 | 5 29 45.42 | 2.2588 | 24 17 28.4 | 4.308 | 8 | 7 15 36.35 | 2.2229 | 25 14 39.7 | 1.884 |
| 9 | 5 32 0.96 | 2.2593 | 24 21 43.0 | 4.179 | 9 | 7 17 49.68 | 2.2211 | 25 12 42.9 | 2.008 |
| 10 | 5 34 16.54 | 2.2598 | 24 25 49.9 | 4.050 | 10 | 7 20 2.88 | 2.2188 | 25 10 38.7 | 2.131 |
| 11 | 5 36 32.14 | 2.2603 | 24 29 49.0 | 3.920 | 11 | 7 22 15.94 | 2.2164 | 25 8 27.1 | 2.254 |
| 12 | 5 38 47.77 | 2.2608 | 24 33 40.3 | 3.790 | 12 | 7 24 28.85 | 2.2140 | 25 6 8.2 | 2.377 |
| 13 | 5 41 3.43 | 2.2611 | 24 37 23.8 | 3.660 | 13 | 7 26 41.62 | 2.2116 | 25 3 41.9 | 2.499 |
| 14 | 5 43 19.11 | 2.2614 | 24 40 59.5 | 3.530 | 14 | 7 28 54.24 | 2.2091 | 25 1 8.3 | 2.620 |
| 15 | 5 45 34.80 | 2.2617 | 24 44 27.4 | 3.400 | 15 | 7 31 6.71 | 2.2066 | 24 58 27.5 | 2.741 |
| 16 | 5 47 50.51 | 2.2619 | 24 47 47.5 | 3.270 | 16 | 7 33 19.03 | 2.2040 | 24 55 39.4 | 2.862 |
| 17 | 5 50 6.23 | 2.2621 | 24 50 59.8 | 3.140 | 17 | 7 35 31.19 | 2.2014 | 24 52 44.1 | 2.982 |
| 18 | 5 52 21.96 | 2.2622 | 24 54 4.3 | 3.009 | 18 | 7 37 43.20 | 2.1988 | 24 49 41.6 | 3.102 |
| 19 | 5 54 37.69 | 2.2622 | 24 57 0.9 | 2.878 | 19 | 7 39 55.05 | 2.1961 | 24 46 31.9 | 3.221 |
| 20 | 5 56 53.42 | 2.2622 | 24 59 49.7 | 2.748 | 20 | 7 42 6.73 | 2.1933 | 24 43 15.1 | 3.339 |
| 21 | 5 59 9.15 | 2.2622 | 25 2 30.7 | 2.617 | 21 | 7 44 18.24 | 2.1904 | 24 39 51.2 | 3.457 |
| 22 | 6 1 24.88 | 2.2620 | 25 5 3.8 | 2.487 | 22 | 7 46 29.58 | 2.1875 | 24 36 20.3 | 3.574 |
| 23 | 6 3 40.59 | 2.2617 | N. 25 7 29.1 | 2.357 | 23 | 7 48 40.74 | 2.1846 | N. 24 32 42.3 | 3.691 |
| WEDNESDAY 18. | | | | | FRIDAY 20. | | | | |
| 0 | 6 5 56.29 | 2.2615 | N. 25 9 46.6 | 2.226 | 0 | 7 53 2.54 | 2.1786 | N. 24 28 57.3 | 3.807 |
| 1 | 6 8 11.97 | 2.2612 | 25 11 56.2 | 2.095 | 1 | 7 55 13.16 | 2.1755 | 24 25 5.4 | 3.923 |
| 2 | 6 10 27.64 | 2.2609 | 25 13 58.0 | 1.964 | 2 | 7 57 23.60 | 2.1725 | 24 21 6.5 | 4.039 |
| 3 | 6 12 43.28 | 2.2604 | 25 15 51.9 | 1.833 | 3 | 7 59 33.86 | 2.1694 | 24 17 0.7 | 4.153 |
| 4 | 6 14 58.89 | 2.2599 | 25 17 38.0 | 1.702 | 4 | 8 1 43.93 | 2.1663 | 24 12 48.1 | 4.267 |
| 5 | 6 17 14.47 | 2.2594 | 25 19 16.2 | 1.572 | 5 | 8 3 53.81 | 2.1630 | 24 8 28.6 | 4.381 |
| 6 | 6 19 30.02 | 2.2588 | 25 20 46.6 | 1.442 | 6 | 8 6 3.49 | 2.1597 | 24 4 2.3 | 4.494 |
| 7 | 6 21 45.53 | 2.2581 | 25 22 9.2 | 1.312 | 7 | 8 8 12.97 | 2.1564 | 23 59 29.3 | 4.606 |
| 8 | 6 24 0.99 | 2.2574 | 25 23 24.0 | 1.181 | 8 | 8 10 22.26 | 2.1531 | 23 54 49.6 | 4.718 |
| 9 | 6 26 16.41 | 2.2568 | 25 24 30.9 | 1.050 | 9 | 8 12 31.35 | 2.1497 | 23 50 3.2 | 4.830 |
| 10 | 6 28 31.78 | 2.2557 | 25 25 30.0 | 0.921 | 10 | 8 14 40.23 | 2.1463 | 23 45 10.1 | 4.939 |
| 11 | 6 30 47.09 | 2.2548 | 25 26 21.4 | 0.792 | 11 | 8 16 48.91 | 2.1430 | 23 40 10.5 | 5.048 |
| 12 | 6 33 2.35 | 2.2538 | 25 27 5.0 | 0.662 | 12 | 8 18 57.39 | 2.1396 | 23 35 4.3 | 5.157 |
| 13 | 6 35 17.55 | 2.2527 | 25 27 40.8 | 0.532 | 13 | 8 21 5.66 | 2.1361 | 23 29 51.6 | 5.266 |
| 14 | 6 37 32.68 | 2.2516 | 25 28 8.8 | 0.402 | 14 | 8 23 13.72 | 2.1325 | 23 24 32.4 | 5.374 |
| 15 | 6 39 47.74 | 2.2504 | 25 28 29.0 | 0.273 | 15 | 8 25 21.56 | 2.1289 | 23 19 6.7 | 5.481 |
| 16 | 6 42 2.73 | 2.2491 | 25 28 41.5 | 0.144 | 16 | 8 27 29.19 | 2.1254 | 23 13 34.7 | 5.587 |
| 17 | 6 44 17.64 | 2.2478 | 25 28 46.3 | + 0.015 | 17 | 8 29 36.61 | 2.1218 | 23 7 56.3 | 5.692 |
| 18 | 6 46 32.47 | 2.2465 | 25 28 43.3 | - 0.114 | 18 | 8 31 43.81 | 2.1182 | 23 2 11.6 | 5.797 |
| 19 | 6 48 47.22 | 2.2452 | 25 28 32.6 | 0.243 | 19 | 8 33 50.79 | 2.1146 | 22 56 20.6 | 5.902 |
| 20 | 6 51 1.89 | 2.2437 | 25 28 14.2 | 0.371 | 20 | 8 35 57.56 | 2.1110 | 22 50 23.4 | 6.005 |
| 21 | 6 53 16.47 | 2.2422 | 25 27 48.1 | 0.498 | 21 | 8 38 4.11 | 2.1073 | 22 44 20.0 | 6.108 |
| 22 | 6 55 30.95 | 2.2405 | 25 27 14.4 | 0.626 | 22 | 8 40 10.43 | 2.1035 | 22 38 10.4 | 6.211 |
| 23 | 6 57 45.33 | 2.2387 | 25 26 33.0 | 0.753 | 23 | 8 42 16.53 | 2.0998 | 22 31 54.7 | 6.312 |
| 24 | 6 59 59.60 | 2.2370 | N. 25 25 44.0 | 0.880 | 24 | 8 44 22.41 | 2.0961 | N. 22 25 33.0 | 6.419 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|-----------------|---------------------|-------------|------------------|---------------------|-----------------|---------------------|
| SATURDAY 21. | | | | | MONDAY 23. | | | | |
| 0 | h 44 22.41 | 2.0061 | N. 22° 25' 33.0 | 6.412 | 0 | h 10 20 38.15 | 1.9187 | N. 15° 36' 23.4 | 10.334 |
| 1 | 8 46 28.06 | 2.0023 | 22 19 5.3 | 6.512 | 1 | 10 22 33.18 | 1.9155 | 15 26 1.5 | 10.398 |
| 2 | 8 48 33.49 | 2.0086 | 22 12 31.6 | 6.612 | 2 | 10 24 28.01 | 1.9122 | 15 15 35.9 | 10.457 |
| 3 | 8 50 38.69 | 2.0048 | 22 5 51.9 | 6.711 | 3 | 10 26 22.64 | 1.9089 | 15 5 6.7 | 10.517 |
| 4 | 8 52 43.67 | 2.0011 | 21 59 6.3 | 6.808 | 4 | 10 28 17.08 | 1.9058 | 14 54 33.9 | 10.577 |
| 5 | 8 54 48.42 | 2.0073 | 21 52 14.9 | 6.904 | 5 | 10 30 11.34 | 1.9027 | 14 43 57.5 | 10.637 |
| 6 | 8 56 52.94 | 2.0034 | 21 45 17.8 | 7.000 | 6 | 10 32 5.41 | 1.8997 | 14 33 17.5 | 10.695 |
| 7 | 8 58 57.23 | 2.0096 | 21 38 14.9 | 7.096 | 7 | 10 33 59.30 | 1.8966 | 14 22 34.1 | 10.752 |
| 8 | 9 1 1.29 | 2.0058 | 21 31 6.3 | 7.191 | 8 | 10 35 53.00 | 1.8935 | 14 11 47.3 | 10.808 |
| 9 | 9 3 5.13 | 2.0021 | 21 23 52.0 | 7.285 | 9 | 10 37 46.52 | 1.8906 | 14 0 57.1 | 10.865 |
| 10 | 9 5 8.74 | 2.0082 | 21 16 32.1 | 7.378 | 10 | 10 39 39.87 | 1.8877 | 13 50 3.5 | 10.921 |
| 11 | 9 7 12.11 | 2.0043 | 21 9 6.7 | 7.470 | 11 | 10 41 33.04 | 1.8847 | 13 39 6.6 | 10.975 |
| 12 | 9 9 15.25 | 2.0004 | 21 1 35.7 | 7.562 | 12 | 10 43 26.03 | 1.8818 | 13 28 6.5 | 11.028 |
| 13 | 9 11 18.16 | 2.0466 | 20 53 59.2 | 7.653 | 13 | 10 45 18.85 | 1.8790 | 13 17 3.2 | 11.081 |
| 14 | 9 13 20.84 | 2.0427 | 20 46 17.3 | 7.743 | 14 | 10 47 11.51 | 1.8769 | 13 5 56.8 | 11.133 |
| 15 | 9 15 23.29 | 2.0389 | 20 38 30.1 | 7.832 | 15 | 10 49 4.00 | 1.8735 | 12 54 47.3 | 11.184 |
| 16 | 9 17 25.51 | 2.0351 | 20 30 37.5 | 7.920 | 16 | 10 50 56.33 | 1.8708 | 12 43 34.7 | 11.235 |
| 17 | 9 19 27.50 | 2.0313 | 20 22 39.7 | 8.008 | 17 | 10 52 48.50 | 1.8681 | 12 32 19.1 | 11.285 |
| 18 | 9 21 29.26 | 2.0274 | 20 14 36.6 | 8.095 | 18 | 10 54 40.50 | 1.8654 | 12 21 0.5 | 11.334 |
| 19 | 9 23 30.79 | 2.0236 | 20 6 28.3 | 8.181 | 19 | 10 56 32.35 | 1.8629 | 12 9 39.0 | 11.388 |
| 20 | 9 25 32.09 | 2.0197 | 19 58 14.9 | 8.266 | 20 | 10 58 24.05 | 1.8603 | 11 58 14.7 | 11.439 |
| 21 | 9 27 33.16 | 2.0159 | 19 49 56.4 | 8.351 | 21 | 11 0 15.59 | 1.8578 | 11 46 47.5 | 11.476 |
| 22 | 9 29 34.00 | 2.0121 | 19 41 32.8 | 8.435 | 22 | 11 2 6.99 | 1.8554 | 11 35 17.6 | 11.522 |
| 23 | 9 31 34.61 | 2.0082 | N. 19° 33' 4.2 | 8.518 | 23 | 11 3 58.24 | 1.8529 | N. 11° 23' 44.9 | 11.567 |
| SUNDAY 22. | | | | | TUESDAY 24. | | | | |
| 0 | 9 33 34.99 | 2.0044 | N. 19° 24' 30.6 | 8.601 | 0 | 11 5 49.34 | 1.8505 | N. 11° 12' 9.5 | 11.619 |
| 1 | 9 35 35.14 | 2.0007 | 19 15 52.1 | 8.689 | 1 | 11 7 40.30 | 1.8482 | 11 0 31.5 | 11.655 |
| 2 | 9 37 35.07 | 1.9969 | 19 7 8.8 | 8.782 | 2 | 11 9 31.13 | 1.8460 | 10 48 50.9 | 11.698 |
| 3 | 9 39 34.77 | 1.9932 | 18 58 20.7 | 8.841 | 3 | 11 11 21.82 | 1.8438 | 10 37 7.7 | 11.741 |
| 4 | 9 41 34.25 | 1.9894 | 18 49 27.9 | 8.920 | 4 | 11 13 12.38 | 1.8416 | 10 25 22.0 | 11.782 |
| 5 | 9 43 33.50 | 1.9857 | 18 40 30.3 | 8.999 | 5 | 11 15 2.81 | 1.8394 | 10 13 33.9 | 11.822 |
| 6 | 9 45 32.53 | 1.9820 | 18 31 28.0 | 9.077 | 6 | 11 16 53.11 | 1.8373 | 10 1 43.3 | 11.862 |
| 7 | 9 47 31.34 | 1.9782 | 18 22 21.1 | 9.153 | 7 | 11 18 43.28 | 1.8352 | 9 49 50.4 | 11.901 |
| 8 | 9 49 29.92 | 1.9745 | 18 13 9.7 | 9.228 | 8 | 11 20 33.34 | 1.8333 | 9 37 55.2 | 11.939 |
| 9 | 9 51 28.28 | 1.9708 | 18 3 53.7 | 9.304 | 9 | 11 22 23.28 | 1.8314 | 9 25 57.7 | 11.977 |
| 10 | 9 53 26.42 | 1.9673 | 17 54 33.2 | 9.378 | 10 | 11 24 13.11 | 1.8295 | 9 13 57.9 | 12.015 |
| 11 | 9 55 24.35 | 1.9636 | 17 45 8.3 | 9.452 | 11 | 11 26 2.82 | 1.8276 | 9 1 55.9 | 12.051 |
| 12 | 9 57 22.06 | 1.9600 | 17 35 39.0 | 9.524 | 12 | 11 27 52.42 | 1.8258 | 8 49 51.8 | 12.086 |
| 13 | 9 59 19.55 | 1.9564 | 17 26 5.4 | 9.596 | 13 | 11 29 41.92 | 1.8241 | 8 37 45.6 | 12.121 |
| 14 | 10 1 16.83 | 1.9529 | 17 16 27.5 | 9.667 | 14 | 11 31 31.31 | 1.8224 | 8 25 37.3 | 12.155 |
| 15 | 10 3 13.90 | 1.9493 | 17 6 45.4 | 9.737 | 15 | 11 33 20.60 | 1.8208 | 8 13 27.0 | 12.188 |
| 16 | 10 5 10.75 | 1.9457 | 16 56 59.1 | 9.807 | 16 | 11 35 9.80 | 1.8192 | 8 1 14.8 | 12.220 |
| 17 | 10 7 7.39 | 1.9423 | 16 47 8.6 | 9.876 | 17 | 11 36 58.90 | 1.8176 | 7 49 0.6 | 12.252 |
| 18 | 10 9 3.83 | 1.9389 | 16 37 14.0 | 9.943 | 18 | 11 38 47.91 | 1.8161 | 7 36 44.5 | 12.283 |
| 19 | 10 11 0.06 | 1.9354 | 16 27 15.4 | 10.010 | 19 | 11 40 36.83 | 1.8147 | 7 24 26.6 | 12.313 |
| 20 | 10 12 56.08 | 1.9320 | 16 17 12.8 | 10.076 | 20 | 11 42 25.67 | 1.8133 | 7 12 6.9 | 12.343 |
| 21 | 10 14 51.90 | 1.9286 | 16 7 6.3 | 10.141 | 21 | 11 44 14.42 | 1.8119 | 6 59 45.4 | 12.372 |
| 22 | 10 16 47.51 | 1.9253 | 15 56 55.9 | 10.206 | 22 | 11 46 3.10 | 1.8106 | 6 47 22.2 | 12.400 |
| 23 | 10 18 42.93 | 1.9220 | 15 46 41.6 | 10.271 | 23 | 11 47 51.70 | 1.8094 | 6 34 57.4 | 12.428 |
| 24 | 10 20 38.15 | 1.9187 | N. 15° 36' 23.4 | 10.334 | 24 | 11 49 40.23 | 1.8083 | N. 6° 22' 30.9 | 12.455 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|--|---------------------|-----------------|---------------------|--------------|--|---------------------|-----------------|---------------------|
| WEDNESDAY 25. | | | | | FRIDAY 27. | | | | |
| 0 | ^h 11 ^m 49 ^s 40.23 | 1.8083 | N. 6° 22' 30.9" | 12.455 | 0 | ^h 13 ^m 16 ^s 12.48 | 1.8906 | S. 3° 52' 21.9" | 12.889 |
| 1 | 11 51 28.69 | 1.8079 | 6 10 2.8 | 12.481 | 1 | 13 18 1.77 | 1.8904 | 4 5 15.0 | 12.880 |
| 2 | 11 53 17.09 | 1.8061 | 5 57 33.2 | 12.505 | 2 | 13 19 51.17 | 1.8942 | 4 18 7.5 | 12.870 |
| 3 | 11 55 5.42 | 1.8050 | 5 45 2.2 | 12.539 | 3 | 13 21 40.68 | 1.8969 | 4 30 59.4 | 12.860 |
| 4 | 11 56 53.69 | 1.8041 | 5 32 29.7 | 12.553 | 4 | 13 23 30.31 | 1.8982 | 4 43 50.7 | 12.849 |
| 5 | 11 58 41.91 | 1.8032 | 5 19 55.8 | 12.577 | 5 | 13 25 20.06 | 1.8302 | 4 56 41.3 | 12.837 |
| 6 | 12 0 30.08 | 1.8024 | 5 7 20.5 | 12.599 | 6 | 13 27 9.93 | 1.8323 | 5 9 31.2 | 12.825 |
| 7 | 12 2 18.20 | 1.8016 | 4 54 43.9 | 12.621 | 7 | 13 28 59.93 | 1.8344 | 5 22 20.3 | 12.812 |
| 8 | 12 4 6.27 | 1.8006 | 4 42 6.0 | 12.643 | 8 | 13 30 50.06 | 1.8367 | 5 35 8.6 | 12.797 |
| 9 | 12 5 54.30 | 1.8002 | 4 29 26.9 | 12.662 | 9 | 13 32 40.33 | 1.8390 | 5 47 56.0 | 12.782 |
| 10 | 12 7 42.29 | 1.7996 | 4 16 46.6 | 12.681 | 10 | 13 34 30.74 | 1.8413 | 6 0 42.5 | 12.767 |
| 11 | 12 9 30.25 | 1.7991 | 4 4 5.2 | 12.700 | 11 | 13 36 21.29 | 1.8437 | 6 13 28.0 | 12.750 |
| 12 | 12 11 18.18 | 1.7986 | 3 51 22.6 | 12.718 | 12 | 13 38 11.99 | 1.8462 | 6 26 12.5 | 12.733 |
| 13 | 12 13 6.08 | 1.7981 | 3 38 39.0 | 12.735 | 13 | 13 40 2.84 | 1.8488 | 6 38 56.0 | 12.715 |
| 14 | 12 14 53.95 | 1.7977 | 3 25 54.4 | 12.752 | 14 | 13 41 53.85 | 1.8514 | 6 51 38.3 | 12.696 |
| 15 | 12 16 41.80 | 1.7973 | 3 13 8.8 | 12.768 | 15 | 13 43 45.01 | 1.8541 | 7 4 19.5 | 12.677 |
| 16 | 12 18 29.63 | 1.7971 | 3 0 22.2 | 12.783 | 16 | 13 45 36.34 | 1.8569 | 7 16 59.5 | 12.656 |
| 17 | 12 20 17.45 | 1.7969 | 2 47 34.8 | 12.798 | 17 | 13 47 27.84 | 1.8597 | 7 29 38.2 | 12.634 |
| 18 | 12 22 5.26 | 1.7968 | 2 34 46.5 | 12.812 | 18 | 13 49 19.51 | 1.8626 | 7 42 15.6 | 12.619 |
| 19 | 12 23 53.06 | 1.7967 | 2 21 57.4 | 12.824 | 19 | 13 51 11.35 | 1.8656 | 7 54 51.7 | 12.599 |
| 20 | 12 25 40.86 | 1.7966 | 2 9 7.6 | 12.837 | 20 | 13 53 3.38 | 1.8687 | 8 7 26.4 | 12.586 |
| 21 | 12 27 28.65 | 1.7966 | 1 56 17.0 | 12.849 | 21 | 13 54 55.59 | 1.8718 | 8 19 59.6 | 12.541 |
| 22 | 12 29 16.45 | 1.7967 | 1 43 25.7 | 12.860 | 22 | 13 56 47.99 | 1.8749 | 8 32 31.3 | 12.515 |
| 23 | 12 31 4.26 | 1.7969 | N. 1 30 33.8 | 12.869 | 23 | 13 58 40.58 | 1.8781 | S. 8 45 1.4 | 12.488 |
| THURSDAY 26. | | | | | SATURDAY 28. | | | | |
| 0 | 12 32 52.08 | 1.7971 | N. 1 17 41.4 | 12.878 | 0 | 14 0 33.36 | 1.8813 | S. 8 57 29.9 | 12.462 |
| 1 | 12 34 39.91 | 1.7973 | 1 4 48.4 | 12.887 | 1 | 14 2 26.34 | 1.8847 | 9 9 56.8 | 12.434 |
| 2 | 12 36 27.76 | 1.7977 | 0 51 54.9 | 12.896 | 2 | 14 4 19.53 | 1.8882 | 9 22 22.0 | 12.405 |
| 3 | 12 38 15.63 | 1.7981 | 0 39 0.9 | 12.903 | 3 | 14 6 12.92 | 1.8917 | 9 34 45.4 | 12.375 |
| 4 | 12 40 3.53 | 1.7986 | 0 26 6.5 | 12.909 | 4 | 14 8 6.53 | 1.8952 | 9 47 7.0 | 12.345 |
| 5 | 12 41 51.46 | 1.7990 | 0 13 11.8 | 12.915 | 5 | 14 10 0.35 | 1.8988 | 9 59 26.8 | 12.314 |
| 6 | 12 43 39.41 | 1.7995 | N. 0 0 16.7 | 12.921 | 6 | 14 11 54.39 | 1.9026 | 10 11 44.7 | 12.282 |
| 7 | 12 45 27.40 | 1.8009 | S. 0 12 38.7 | 12.925 | 7 | 14 13 48.66 | 1.9063 | 10 24 0.6 | 12.248 |
| 8 | 12 47 15.44 | 1.8010 | 0 25 34.3 | 12.929 | 8 | 14 15 43.15 | 1.9101 | 10 36 14.5 | 12.214 |
| 9 | 12 49 3.52 | 1.8017 | 0 38 30.1 | 12.932 | 9 | 14 17 37.87 | 1.9140 | 10 48 26.3 | 12.179 |
| 10 | 12 50 51.64 | 1.8025 | 0 51 26.1 | 12.934 | 10 | 14 19 32.83 | 1.9180 | 11 0 36.0 | 12.144 |
| 11 | 12 52 39.82 | 1.8034 | 1 4 22.2 | 12.936 | 11 | 14 21 28.03 | 1.9219 | 11 12 43.6 | 12.107 |
| 12 | 12 54 28.05 | 1.8043 | 1 17 18.4 | 12.937 | 12 | 14 23 23.46 | 1.9259 | 11 24 48.9 | 12.069 |
| 13 | 12 56 16.34 | 1.8053 | 1 30 14.6 | 12.937 | 13 | 14 25 19.14 | 1.9301 | 11 36 51.9 | 12.031 |
| 14 | 12 58 4.69 | 1.8064 | 1 43 10.8 | 12.936 | 14 | 14 27 15.08 | 1.9344 | 11 48 52.6 | 11.992 |
| 15 | 12 59 53.11 | 1.8076 | 1 56 6.9 | 12.934 | 15 | 14 29 11.27 | 1.9387 | 12 0 50.9 | 11.951 |
| 16 | 13 1 41.60 | 1.8088 | 2 9 2.9 | 12.931 | 16 | 14 31 7.72 | 1.9430 | 12 12 46.7 | 11.909 |
| 17 | 13 3 30.16 | 1.8100 | 2 21 58.7 | 12.928 | 17 | 14 33 4.43 | 1.9474 | 12 24 40.0 | 11.867 |
| 18 | 13 5 18.80 | 1.8113 | 2 34 54.3 | 12.925 | 18 | 14 35 1.41 | 1.9519 | 12 36 30.7 | 11.823 |
| 19 | 13 7 7.52 | 1.8127 | 2 47 49.7 | 12.922 | 19 | 14 36 58.66 | 1.9564 | 12 48 18.8 | 11.779 |
| 20 | 13 8 56.33 | 1.8142 | 3 0 44.9 | 12.918 | 20 | 14 38 56.18 | 1.9610 | 13 0 4.2 | 11.734 |
| 21 | 13 10 45.23 | 1.8157 | 3 13 39.8 | 12.911 | 21 | 14 40 53.98 | 1.9657 | 13 11 46.9 | 11.688 |
| 22 | 13 12 34.22 | 1.8172 | 3 26 34.3 | 12.904 | 22 | 14 42 52.06 | 1.9704 | 13 23 26.8 | 11.641 |
| 23 | 13 14 23.30 | 1.8188 | 3 39 28.3 | 12.897 | 23 | 14 44 50.43 | 1.9752 | 13 35 3.8 | 11.599 |
| 24 | 13 16 12.48 | 1.8206 | S. 3 52 21.9 | 12.889 | 24 | 14 46 49.09 | 1.9801 | S. 13 46 37.9 | 11.543 |

GREENWICH MEAN TIME.

PHASES OF THE MOON.

| | | | | | | | | | | | |
|------------------------|---|---|---|---|---|---|---|-------------|----------------|----------------|------------------|
| ☾ Last Quarter | . | . | . | . | . | . | . | Feb. | d, 1 | h 16 | m 42.1 |
| ● New Moon | . | . | . | . | . | . | . | . | 8 | 14 | 12.2 |
| ☽ First Quarter | . | . | . | . | . | . | . | . | 15 | 6 | 29.5 |
| ○ Full Moon | . | . | . | . | . | . | . | . | 23 | 7 | 18.4 |

[illegible]

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|
| 1 | Pollux W. | 102° 12' 32" | 2870 | 103° 45' 29" | 2858 | 105° 18' 42" | 2844 | 106° 52' 13" | 2831 |
| | Regulus W. | 66 5 58 | 2878 | 67 38 45 | 2865 | 69 11 49 | 2850 | 70 45 12 | 2836 |
| | SATURN W. | 48 17 48 | 2852 | 49 51 8 | 2838 | 51 24 46 | 2824 | 52 58 43 | 2810 |
| | Antares E. | 34 40 12 | 2915 | 33 8 12 | 2905 | 31 36 0 | 2897 | 30 3 37 | 2889 |
| | VENUS E. | 51 41 54 | 3227 | 50 16 17 | 3215 | 48 50 26 | 3203 | 47 24 20 | 3189 |
| | SUN E. | 97 58 18 | 3247 | 96 33 4 | 3231 | 95 7 32 | 3217 | 93 41 43 | 3202 |
| 2 | Regulus W. | 78 36 53 | 2760 | 80 12 14 | 2743 | 81 47 57 | 2726 | 83 24 2 | 2710 |
| | SATURN W. | 60 53 16 | 2732 | 62 29 13 | 2716 | 64 5 31 | 2700 | 65 42 11 | 2683 |
| | Spica W. | 24 58 49 | 2872 | 26 31 44 | 2844 | 28 5 15 | 2816 | 29 39 22 | 2790 |
| | VENUS E. | 40 9 50 | 3122 | 38 42 7 | 3108 | 37 14 7 | 3095 | 35 45 51 | 3081 |
| | SUN E. | 86 27 54 | 3119 | 85 0 8 | 3102 | 83 32 1 | 3085 | 82 3 33 | 3066 |
| 3 | Regulus W. | 91 30 12 | 2621 | 93 8 38 | 2603 | 94 47 29 | 2585 | 96 26 45 | 2566 |
| | SATURN W. | 73 51 23 | 2594 | 75 30 26 | 2575 | 77 9 55 | 2557 | 78 49 49 | 2538 |
| | Spica W. | 37 38 15 | 2669 | 39 15 36 | 2646 | 40 53 28 | 2624 | 42 31 50 | 2603 |
| | VENUS E. | 28 20 30 | 3020 | 26 50 42 | 3012 | 25 20 44 | 3005 | 23 50 38 | 3001 |
| | SUN E. | 74 35 27 | 2972 | 73 4 39 | 2952 | 71 33 26 | 2932 | 70 1 48 | 2912 |
| 4 | SATURN W. | 87 15 53 | 2443 | 88 58 26 | 2424 | 90 41 26 | 2405 | 92 24 54 | 2386 |
| | Spica W. | 50 51 3 | 2496 | 52 32 22 | 2475 | 54 14 10 | 2454 | 55 56 28 | 2433 |
| | SUN E. | 62 17 18 | 2811 | 60 43 5 | 2792 | 59 8 26 | 2772 | 57 33 22 | 2752 |
| 5 | Spica W. | 64 35 12 | 2333 | 66 20 23 | 2315 | 68 6 1 | 2296 | 69 52 7 | 2277 |
| | Antares W. | 18 57 31 | 2451 | 20 39 53 | 2409 | 22 23 15 | 2373 | 24 7 28 | 2341 |
| | SUN E. | 49 31 27 | 2655 | 47 53 47 | 2636 | 46 15 41 | 2618 | 44 37 11 | 2601 |
| 6 | Spica W. | 78 49 20 | 2190 | 80 38 3 | 2173 | 82 27 11 | 2158 | 84 16 42 | 2143 |
| | Antares W. | 32 58 52 | 2218 | 34 46 53 | 2197 | 36 35 25 | 2178 | 38 24 26 | 2159 |
| | SUN E. | 36 18 55 | 2522 | 34 38 13 | 2510 | 32 57 13 | 2487 | 31 15 56 | 2466 |
| 7 | Spica W. | 93 29 44 | 2077 | 95 21 19 | 2065 | 97 13 12 | 2055 | 99 5 21 | 2044 |
| | Antares W. | 47 36 1 | 2082 | 49 27 28 | 2068 | 51 19 16 | 2056 | 53 11 23 | 2045 |
| | SUN E. | 22 46 33 | 2465 | 21 4 30 | 2470 | 19 22 35 | 2482 | 17 40 56 | 2502 |
| 10 | SUN W. | 20 44 14 | 2327 | 22 27 53 | 2321 | 24 11 41 | 2327 | 25 55 34 | 2327 |
| | MARS E. | 29 55 59 | 2253 | 28 8 51 | 2267 | 26 22 3 | 2263 | 24 35 39 | 2302 |
| | α Arietis E. | 56 18 5 | 2153 | 54 28 27 | 2169 | 52 39 13 | 2186 | 50 50 24 | 2204 |
| | Aldebaran E. | 86 9 37 | 2006 | 84 16 12 | 2014 | 82 22 59 | 2021 | 80 29 58 | 2030 |
| 11 | SUN W. | 34 34 10 | 2414 | 36 17 25 | 2424 | 38 0 26 | 2434 | 39 43 12 | 2446 |
| | α Arietis E. | 41 54 14 | 2330 | 40 8 58 | 2364 | 38 24 31 | 2401 | 36 40 57 | 2443 |
| | Aldebaran E. | 71 8 37 | 2084 | 69 17 13 | 2097 | 67 26 9 | 2111 | 65 35 26 | 2124 |
| | Pollux E. | 115 16 22 | 2073 | 113 24 42 | 2086 | 111 33 21 | 2099 | 109 42 20 | 2111 |
| 12 | SUN W. | 48 12 30 | 2516 | 49 53 21 | 2531 | 51 33 51 | 2548 | 53 13 58 | 2565 |
| | Aldebaran E. | 56 27 23 | 2202 | 54 38 58 | 2218 | 52 50 58 | 2237 | 51 3 25 | 2254 |
| | Pollux E. | 100 32 25 | 2184 | 98 43 33 | 2200 | 96 55 5 | 2216 | 95 7 1 | 2232 |
| 13 | SUN W. | 61 28 38 | 2653 | 63 6 21 | 2671 | 64 43 40 | 2689 | 66 20 34 | 2708 |
| | α Pegasi W. | 40 34 56 | 3388 | 41 57 26 | 3333 | 43 20 59 | 3288 | 44 45 25 | 3248 |
| | Aldebaran E. | 42 12 26 | 2350 | 40 27 40 | 2371 | 38 43 23 | 2391 | 36 59 36 | 2414 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
| 1 | Pollux W. | 108 26 1 | 2816 | 110 0 8 | 2801 | 111 34 35 | 2786 | 113 9 21 | 2771 |
| | Regulus W. | 72 18 53 | 2821 | 73 52 53 | 2806 | 75 27 13 | 2791 | 77 1 53 | 2775 |
| | SATURN W. | 54 32 58 | 2793 | 56 7 32 | 2780 | 57 42 26 | 2764 | 59 17 41 | 2749 |
| | Antares E. | 28 31 4 | 2681 | 26 58 21 | 2676 | 25 25 31 | 2671 | 23 52 35 | 2669 |
| | VENUS E. | 45 57 58 | 3177 | 44 31 21 | 3163 | 43 4 27 | 3149 | 41 37 17 | 3135 |
| | SUN E. | 92 15 36 | 3186 | 90 49 10 | 3170 | 89 22 25 | 3153 | 87 55 20 | 3136 |
| 2 | Regulus W. | 85 0 29 | 2692 | 86 37 19 | 2675 | 88 14 33 | 2657 | 89 52 10 | 2639 |
| | SATURN W. | 67 19 14 | 2666 | 68 56 40 | 2648 | 70 34 30 | 2630 | 72 12 44 | 2612 |
| | Spica W. | 31 14 3 | 2764 | 32 49 18 | 2740 | 34 25 5 | 2716 | 36 1 24 | 2692 |
| | VENUS E. | 34 17 18 | 3068 | 32 48 29 | 3056 | 31 19 25 | 3043 | 29 50 5 | 3030 |
| | SUN E. | 80 34 42 | 3047 | 79 5 28 | 3029 | 77 35 51 | 3010 | 76 5 51 | 2991 |
| 3 | Regulus W. | 98 6 27 | 2547 | 99 46 35 | 2539 | 101 27 8 | 2510 | 103 8 8 | 2491 |
| | SATURN W. | 80 30 9 | 2520 | 82 10 55 | 2500 | 83 52 8 | 2482 | 85 33 47 | 2462 |
| | Spica W. | 44 10 41 | 2581 | 45 50 2 | 2559 | 47 29 53 | 2538 | 49 10 13 | 2517 |
| | VENUS E. | 22 20 27 | 3001 | 20 50 16 | 3004 | 19 20 8 | 3011 | 17 50 9 | 3023 |
| | SUN E. | 68 29 45 | 2893 | 66 57 17 | 2873 | 65 24 23 | 2852 | 63 51 3 | 2833 |
| 4 | SATURN W. | 94 8 49 | 2267 | 95 53 11 | 2248 | 97 38 1 | 2239 | 99 23 18 | 2210 |
| | Spica W. | 57 39 15 | 2413 | 59 22 31 | 2393 | 61 6 16 | 2373 | 62 50 30 | 2353 |
| | SUN E. | 55 57 51 | 2732 | 54 21 54 | 2712 | 52 45 30 | 2693 | 51 8 41 | 2675 |
| 5 | Spica W. | 71 38 41 | 2358 | 73 25 42 | 2241 | 75 13 9 | 2223 | 77 1 2 | 2206 |
| | Antares W. | 25 52 28 | 2313 | 27 38 9 | 2287 | 29 24 28 | 2262 | 31 11 23 | 2239 |
| | SUN E. | 42 58 17 | 2583 | 41 18 59 | 2567 | 39 39 19 | 2551 | 37 59 17 | 2537 |
| 6 | Spica W. | 86 6 36 | 2128 | 87 56 52 | 2115 | 89 47 29 | 2101 | 91 38 27 | 2088 |
| | Antares W. | 40 13 55 | 2142 | 42 3 50 | 2125 | 43 54 11 | 2110 | 45 44 55 | 2096 |
| | SUN E. | 29 34 23 | 2477 | 27 52 37 | 2470 | 26 10 41 | 2465 | 24 28 38 | 2463 |
| 7 | Spica W. | 100 57 46 | 2035 | 102 50 25 | 2027 | 104 43 17 | 2020 | 106 36 20 | 2013 |
| | Antares W. | 55 3 47 | 2034 | 56 56 28 | 2025 | 58 49 23 | 2016 | 60 42 32 | 2009 |
| | SUN E. | 15 59 45 | 2535 | 14 19 20 | 2585 | 12 40 5 | 2666 | 11 2 39 | 2805 |
| 10 | SUN W. | 27 39 28 | 2389 | 29 23 19 | 2392 | 31 7 5 | 2398 | 32 50 43 | 2405 |
| | MARS E. | 22 49 42 | 2324 | 21 4 17 | 2349 | 19 19 29 | 2379 | 17 35 24 | 2413 |
| | α Arietis E. | 49 2 3 | 2225 | 47 14 12 | 2247 | 45 26 55 | 2272 | 43 40 14 | 2300 |
| | Aldebaran E. | 78 37 10 | 2039 | 76 44 37 | 2050 | 74 52 20 | 2061 | 73 0 20 | 2072 |
| 11 | SUN W. | 41 25 41 | 2459 | 43 7 52 | 2472 | 44 49 45 | 2486 | 46 31 18 | 2501 |
| | α Arietis E. | 34 58 23 | 2489 | 33 16 54 | 2542 | 31 36 39 | 2601 | 29 57 46 | 2669 |
| | Aldebaran E. | 63 45 4 | 2139 | 61 55 4 | 2154 | 60 5 27 | 2169 | 58 16 13 | 2185 |
| | Pollux E. | 107 51 38 | 2125 | 106 1 17 | 2139 | 104 11 17 | 2154 | 102 21 40 | 2169 |
| 12 | SUN W. | 54 53 41 | 2582 | 56 33 1 | 2599 | 58 11 58 | 2617 | 59 50 30 | 2635 |
| | Aldebaran E. | 49 16 18 | 2272 | 47 29 38 | 2291 | 45 43 26 | 2311 | 43 57 42 | 2330 |
| | Pollux E. | 93 19 21 | 2249 | 91 32 6 | 2265 | 89 45 15 | 2283 | 87 58 50 | 2300 |
| 13 | SUN W. | 67 57 3 | 2737 | 69 33 7 | 2746 | 71 8 46 | 2765 | 72 44 0 | 2783 |
| | α Pegasi W. | 46 10 37 | 2215 | 47 36 28 | 2188 | 49 2 51 | 2166 | 50 29 41 | 2148 |
| | Aldebaran E. | 35 16 21 | 2436 | 33 33 38 | 2459 | 31 51 27 | 2483 | 30 9 50 | 2507 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|-------------|----------------|------------|----------------|-------------|----------------|
| 13 | Pollux E. | 86° 12' 50" | 2317 | 84° 27' 16" | 2335 | 82° 42' 7" | 2353 | 80° 57' 24" | 2370 |
| | Regulus E. | 122 19 16 | 2328 | 120 33 57 | 2344 | 118 49 2 | 2369 | 117 4 32 | 2378 |
| 14 | SUN W. | 74 18 50 | 2802 | 75 53 15 | 2891 | 77 27 15 | 2839 | 79 0 52 | 2859 |
| | α Pegasi W. | 51 56 53 | 3132 | 53 24 24 | 3130 | 54 52 9 | 3111 | 56 20 5 | 3104 |
| | MARS W. | 25 48 48 | 2748 | 27 24 24 | 2761 | 28 59 43 | 2775 | 30 34 44 | 2788 |
| | Pollux E. | 72 20 11 | 2460 | 70 38 1 | 2477 | 68 56 15 | 2494 | 67 14 54 | 2512 |
| | Regulus E. | 108 28 11 | 2465 | 106 46 9 | 2482 | 105 4 31 | 2500 | 103 23 18 | 2517 |
| 15 | SUN W. | 86 42 58 | 2948 | 88 14 14 | 2967 | 89 45 8 | 2985 | 91 15 40 | 3002 |
| | α Pegasi W. | 63 41 3 | 3098 | 65 9 15 | 3101 | 66 37 24 | 3105 | 68 5 28 | 3110 |
| | MARS W. | 38 25 5 | 2864 | 39 58 10 | 2879 | 41 30 56 | 2894 | 43 3 22 | 2910 |
| | Pollux E. | 58 54 14 | 2599 | 57 15 17 | 2615 | 55 36 42 | 2632 | 53 58 30 | 2648 |
| | Regulus E. | 95 3 4 | 2601 | 93 24 10 | 2616 | 91 45 39 | 2633 | 90 7 29 | 2649 |
| 16 | SUN W. | 98 43 4 | 3085 | 100 11 32 | 3100 | 101 39 42 | 3115 | 103 7 33 | 3131 |
| | α Pegasi W. | 75 24 1 | 3144 | 76 51 17 | 3153 | 78 18 22 | 3163 | 79 45 16 | 3172 |
| | MARS W. | 50 40 42 | 2985 | 52 11 14 | 2999 | 53 41 28 | 3013 | 55 11 25 | 3027 |
| | α Arietis W. | 31 45 56 | 3190 | 33 13 41 | 3101 | 34 41 49 | 3087 | 36 10 15 | 3074 |
| | Pollux E. | 45 52 56 | 2727 | 44 16 52 | 2742 | 42 41 8 | 2757 | 41 5 44 | 2772 |
| | Regulus E. | 82 1 56 | 2725 | 80 25 49 | 2740 | 78 50 2 | 2753 | 77 14 33 | 2768 |
| 17 | SUN W. | 110 22 20 | 3201 | 111 48 28 | 3214 | 113 14 20 | 3228 | 114 39 56 | 3240 |
| | α Pegasi W. | 86 56 51 | 3224 | 88 22 32 | 3235 | 89 48 0 | 3246 | 91 13 15 | 3258 |
| | α Arietis W. | 43 35 3 | 3050 | 45 4 14 | 3049 | 46 33 26 | 3049 | 48 2 38 | 3051 |
| | Pollux E. | 33 13 32 | 2844 | 31 40 1 | 2859 | 30 6 49 | 2873 | 28 33 56 | 2887 |
| | Regulus E. | 69 21 36 | 2833 | 67 17 51 | 2845 | 66 14 21 | 2857 | 64 41 7 | 2868 |
| | Spica E. | 123 22 9 | 2850 | 121 48 46 | 2860 | 120 15 36 | 2870 | 118 42 39 | 2881 |
| 18 | SUN W. | 121 44 24 | 3300 | 123 8 36 | 3309 | 124 32 37 | 3319 | 125 56 26 | 3331 |
| | α Pegasi W. | 98 16 0 | 3319 | 99 39 50 | 3329 | 101 3 24 | 3345 | 102 26 43 | 3358 |
| | α Arietis W. | 55 28 0 | 3066 | 56 56 53 | 3068 | 58 25 42 | 3072 | 59 54 26 | 3075 |
| | Aldebaran W. | 24 8 52 | 3004 | 25 39 0 | 3004 | 27 9 8 | 3004 | 28 39 16 | 3004 |
| | Regulus E. | 56 58 29 | 2922 | 55 26 38 | 2932 | 53 55 0 | 2949 | 52 23 34 | 2950 |
| | SATURN E. | 73 30 46 | 2883 | 71 58 5 | 2891 | 70 25 35 | 2901 | 68 53 17 | 2909 |
| | Spica E. | 111 1 9 | 2929 | 109 29 27 | 2937 | 107 57 55 | 2946 | 106 26 34 | 2954 |
| 19 | α Pegasi W. | 109 19 19 | 3432 | 110 40 59 | 3448 | 112 2 21 | 3465 | 113 23 24 | 3482 |
| | α Arietis W. | 67 16 53 | 3096 | 68 45 7 | 3101 | 70 13 16 | 3105 | 71 41 19 | 3109 |
| | Aldebaran W. | 36 9 26 | 3018 | 37 39 17 | 3022 | 39 9 3 | 3025 | 40 38 45 | 3029 |
| | Regulus E. | 44 49 14 | 2995 | 43 18 55 | 3003 | 41 48 46 | 3012 | 40 18 48 | 3020 |
| | SATURN E. | 61 14 22 | 2948 | 59 43 4 | 2954 | 58 11 54 | 2962 | 56 40 53 | 2969 |
| | Spica E. | 98 52 19 | 2991 | 97 21 55 | 2998 | 95 51 40 | 3004 | 94 21 32 | 3010 |
| 20 | α Arietis W. | 79 0 25 | 3129 | 80 28 0 | 3132 | 81 55 31 | 3135 | 83 22 58 | 3139 |
| | Aldebaran W. | 48 6 6 | 3047 | 49 35 21 | 3050 | 51 4 32 | 3053 | 52 33 39 | 3056 |
| | Regulus E. | 32 51 29 | 3061 | 31 22 32 | 3070 | 29 53 46 | 3079 | 28 25 11 | 3089 |
| | SATURN E. | 49 7 46 | 2997 | 47 37 29 | 3002 | 46 7 19 | 3007 | 44 37 15 | 3012 |
| | Spica E. | 86 52 43 | 3038 | 85 23 17 | 3043 | 83 53 57 | 3047 | 82 24 42 | 3052 |
| 21 | α Arietis W. | 90 39 8 | 3156 | 92 6 10 | 3158 | 93 33 9 | 3162 | 95 0 4 | 3165 |
| | Aldebaran W. | 59 58 19 | 3070 | 61 27 5 | 3073 | 62 55 48 | 3074 | 64 24 29 | 3076 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|------------|----------------|-------------|----------------|-------------|----------------|------------|----------------|
| 13 | Pollux E. | 79° 13' 6" | 9388 | 77° 29' 14" | 9406 | 75° 45' 48" | 9494 | 74° 2' 47" | 9441 |
| | Regulus E. | 115 20 26 | 9396 | 113 36 45 | 9413 | 111 53 29 | 9431 | 110 10 38 | 9448 |
| 14 | SUN W. | 80 34 4 | 9377 | 82 6 52 | 9395 | 83 39 17 | 9313 | 85 11 19 | 9331 |
| | α Pegasi W. | 57 48 10 | 3100 | 59 16 20 | 3098 | 60 44 34 | 3096 | 62 12 49 | 3096 |
| | MARS W. | 32 9 27 | 9803 | 33 43 51 | 9818 | 35 17 55 | 9833 | 36 51 40 | 9848 |
| | Pollux E. | 65 33 58 | 9530 | 63 53 26 | 9547 | 62 13 18 | 9564 | 60 33 34 | 9582 |
| | Regulus E. | 101 42 28 | 9534 | 100 2 2 | 9551 | 98 22 0 | 9568 | 96 42 21 | 9584 |
| 15 | SUN W. | 92 45 50 | 3019 | 94 15 39 | 3035 | 95 45 8 | 3052 | 97 14 16 | 3069 |
| | α Pegasi W. | 69 33 26 | 3115 | 71 1 17 | 3121 | 72 29 1 | 3129 | 73 56 36 | 3137 |
| | MARS W. | 44 35 28 | 9925 | 46 7 15 | 9940 | 47 38 43 | 9955 | 49 9 52 | 9970 |
| | Pollux E. | 52 20 40 | 9664 | 50 43 12 | 9681 | 49 6 6 | 9696 | 47 29 21 | 9711 |
| | Regulus E. | 88 29 41 | 9665 | 86 52 14 | 9681 | 85 15 8 | 9695 | 83 38 22 | 9710 |
| 16 | SUN W. | 104 35 5 | 3146 | 106 2 19 | 3159 | 107 29 17 | 3174 | 108 55 57 | 3188 |
| | α Pegasi W. | 81 11 59 | 3189 | 82 38 30 | 3191 | 84 4 50 | 3202 | 85 30 57 | 3213 |
| | MARS W. | 56 41 4 | 3040 | 58 10 27 | 3054 | 59 39 33 | 3067 | 61 8 23 | 3080 |
| | α Arietis W. | 37 38 56 | 3065 | 39 7 48 | 3059 | 40 36 48 | 3054 | 42 5 54 | 3052 |
| | Pollux E. | 39 30 40 | 2787 | 37 55 55 | 2801 | 36 21 29 | 2815 | 34 47 21 | 2830 |
| | Regulus E. | 75 39 23 | 2781 | 74 4 30 | 2795 | 72 29 55 | 2808 | 70 55 37 | 2821 |
| 17 | SUN W. | 116 5 18 | 3253 | 117 30 25 | 3265 | 118 55 18 | 3276 | 120 19 57 | 3287 |
| | α Pegasi W. | 92 38 16 | 3269 | 94 3 4 | 3282 | 95 27 37 | 3294 | 96 51 56 | 3306 |
| | α Arietis W. | 49 31 48 | 3052 | 51 0 56 | 3055 | 52 30 1 | 3058 | 53 59 2 | 3060 |
| | Pollux E. | 27 1 21 | 9903 | 25 29 6 | 9918 | 23 57 10 | 9934 | 22 25 34 | 9950 |
| | Regulus E. | 63 8 7 | 2880 | 61 35 22 | 2891 | 60 2 51 | 2901 | 58 30 33 | 2912 |
| | Spica E. | 117 9 56 | 2891 | 115 37 26 | 2901 | 114 5 8 | 2911 | 112 33 3 | 2920 |
| 18 | SUN W. | 127 20 2 | 3341 | 128 43 28 | 3351 | 130 6 41 | 3359 | 131 29 44 | 3368 |
| | α Pegasi W. | 103 49 47 | 3372 | 105 12 35 | 3387 | 106 35 6 | 3401 | 107 57 21 | 3416 |
| | α Arietis W. | 61 23 6 | 3079 | 62 51 41 | 3084 | 64 20 10 | 3088 | 65 48 34 | 3092 |
| | Aldebaran W. | 30 9 24 | 3006 | 31 39 29 | 3008 | 33 9 32 | 3011 | 34 39 31 | 3014 |
| | Regulus E. | 50 52 19 | 2960 | 49 21 16 | 2969 | 47 50 24 | 2978 | 46 19 44 | 2986 |
| | SATURN E. | 67 21 10 | 2918 | 65 49 14 | 2925 | 64 17 27 | 2933 | 62 45 50 | 2940 |
| | Spica E. | 104 55 24 | 2969 | 103 24 24 | 2969 | 101 53 33 | 2977 | 100 22 52 | 2984 |
| 19 | α Pegasi W. | 114 44 8 | 3501 | 116 4 31 | 3519 | 117 24 34 | 3539 | 118 44 15 | 3560 |
| | α Arietis W. | 73 9 18 | 3113 | 74 37 12 | 3117 | 76 5 1 | 3191 | 77 32 45 | 3194 |
| | Aldebaran W. | 42 8 22 | 3039 | 43 37 55 | 3036 | 45 7 23 | 3039 | 46 36 47 | 3043 |
| | Regulus E. | 38 49 0 | 3098 | 37 19 22 | 3036 | 35 49 54 | 3044 | 34 20 36 | 3053 |
| | SATURN E. | 55 10 1 | 2974 | 53 39 16 | 2981 | 52 8 39 | 2986 | 50 38 9 | 2992 |
| | Spica E. | 92 51 32 | 3016 | 91 21 39 | 3022 | 89 51 54 | 3027 | 88 22 15 | 3033 |
| 20 | α Arietis W. | 84 50 20 | 3143 | 86 17 38 | 3146 | 87 44 52 | 3149 | 89 12 2 | 3153 |
| | Aldebaran W. | 54 2 42 | 3060 | 55 31 41 | 3069 | 57 0 37 | 3065 | 58 29 30 | 3068 |
| | Regulus E. | 26 56 48 | 3100 | 25 28 38 | 3110 | 24 0 41 | 3124 | 22 33 0 | 3139 |
| | SATURN E. | 43 7 17 | 3016 | 41 37 24 | 3021 | 40 7 37 | 3025 | 38 37 55 | 3030 |
| | Spica E. | 80 55 33 | 3056 | 79 26 29 | 3060 | 77 57 30 | 3064 | 76 28 36 | 3067 |
| 21 | α Arietis W. | 96 26 55 | 3168 | 97 53 43 | 3171 | 99 20 27 | 3173 | 100 47 8 | 3177 |
| | Aldebaran W. | 65 53 8 | 3078 | 67 21 45 | 3080 | 68 50 19 | 3082 | 70 18 51 | 3083 |

GREENWICH MEAN TIME.

LUNAR DISTANCES

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
| 21 | Pollux W. | 15° 56' 37" | 3142 | 17° 23' 56" | 3130 | 18° 51' 29" | 3122 | 20° 19' 12" | 3115 |
| | SATURN E. | 37 8 19 | 3034 | 35 38 48 | 3037 | 34 9 21 | 3041 | 32 39 59 | 3046 |
| | Spica E. | 74 59 46 | 3070 | 73 31 0 | 3073 | 72 2 18 | 3077 | 70 33 40 | 3080 |
| | Antares E. | 120 53 40 | 3067 | 119 24 50 | 3069 | 117 56 2 | 3071 | 116 27 17 | 3073 |
| 22 | α Arietis W. | 102 13 45 | 3179 | 103 40 19 | 3183 | 105 6 49 | 3185 | 106 33 16 | 3188 |
| | Aldebaran W. | 71 47 21 | 3084 | 73 15 50 | 3086 | 74 44 17 | 3087 | 76 12 43 | 3087 |
| | Pollux W. | 27 39 19 | 3098 | 29 7 31 | 3097 | 30 35 44 | 3096 | 32 3 59 | 3095 |
| | Spica E. | 63 11 22 | 3093 | 61 43 4 | 3095 | 60 14 48 | 3097 | 58 46 35 | 3099 |
| | Antares E. | 109 4 7 | 3081 | 107 35 34 | 3082 | 106 7 3 | 3083 | 104 38 33 | 3084 |
| 23 | Aldebaran W. | 83 34 42 | 3090 | 85 3 4 | 3090 | 86 31 26 | 3090 | 87 59 48 | 3089 |
| | Pollux W. | 39 25 32 | 3090 | 40 53 54 | 3088 | 42 22 18 | 3087 | 43 50 43 | 3087 |
| | Spica E. | 51 26 4 | 3108 | 49 58 4 | 3110 | 48 30 7 | 3111 | 47 2 11 | 3114 |
| | Antares E. | 97 16 16 | 3087 | 95 47 50 | 3087 | 94 19 24 | 3087 | 92 50 58 | 3086 |
| 24 | Aldebaran W. | 95 21 47 | 3087 | 96 50 13 | 3085 | 98 18 41 | 3084 | 99 47 10 | 3083 |
| | Pollux W. | 51 13 8 | 3080 | 52 41 42 | 3078 | 54 10 18 | 3077 | 55 38 56 | 3074 |
| | Regulus W. | 15 31 30 | 3229 | 16 56 53 | 3211 | 18 22 49 | 3189 | 19 49 11 | 3171 |
| | Spica E. | 39 43 8 | 3124 | 38 15 27 | 3127 | 36 47 50 | 3129 | 35 20 16 | 3132 |
| | Antares E. | 85 28 38 | 3083 | 84 0 8 | 3082 | 82 31 36 | 3080 | 81 3 2 | 3079 |
| | VENUS E. | 125 33 26 | 3512 | 124 13 15 | 3510 | 122 53 2 | 3507 | 121 32 46 | 3506 |
| 25 | Aldebaran W. | 107 10 2 | 3074 | 108 38 43 | 3072 | 110 7 27 | 3069 | 111 36 14 | 3067 |
| | Pollux W. | 63 2 47 | 3063 | 64 31 42 | 3060 | 66 0 41 | 3057 | 67 29 43 | 3054 |
| | Regulus W. | 27 5 27 | 3114 | 28 33 20 | 3105 | 30 1 23 | 3098 | 31 29 35 | 3091 |
| | Spica E. | 28 3 37 | 3159 | 26 36 39 | 3168 | 25 9 52 | 3179 | 23 43 18 | 3192 |
| | Antares E. | 73 39 45 | 3069 | 72 10 58 | 3068 | 70 42 9 | 3065 | 69 13 16 | 3062 |
| | VENUS E. | 114 50 47 | 3492 | 113 30 14 | 3488 | 112 9 37 | 3486 | 110 48 57 | 3482 |
| 26 | Pollux W. | 74 55 57 | 3035 | 76 25 26 | 3030 | 77 55 1 | 3026 | 79 24 41 | 3022 |
| | Regulus W. | 38 52 35 | 3060 | 40 21 34 | 3053 | 41 50 41 | 3047 | 43 19 56 | 3041 |
| | SATURN W. | 22 49 30 | 3032 | 24 19 3 | 3024 | 25 48 46 | 3017 | 27 18 38 | 3009 |
| | Antares E. | 61 48 0 | 3047 | 60 18 45 | 3043 | 58 49 25 | 3039 | 57 20 1 | 3034 |
| | VENUS E. | 104 4 34 | 3462 | 102 43 27 | 3457 | 101 22 15 | 3453 | 100 0 58 | 3447 |
| | α Aquilæ E. | 107 43 34 | 3886 | 106 30 0 | 3867 | 105 16 7 | 3851 | 104 1 57 | 3836 |
| 27 | Pollux W. | 86 54 36 | 2994 | 88 24 56 | 2988 | 89 55 24 | 2981 | 91 26 0 | 2975 |
| | Regulus W. | 50 48 5 | 3008 | 52 18 8 | 3001 | 53 48 19 | 2994 | 55 18 39 | 2986 |
| | SATURN W. | 34 50 12 | 2974 | 36 20 57 | 2966 | 37 51 52 | 2959 | 39 22 56 | 2952 |
| | Antares E. | 49 51 39 | 3013 | 48 21 42 | 3007 | 46 51 38 | 3002 | 45 21 28 | 2997 |
| | VENUS E. | 93 12 59 | 3418 | 91 51 3 | 3411 | 90 28 59 | 3404 | 89 6 47 | 3396 |
| | α Aquilæ E. | 97 47 30 | 3771 | 96 31 58 | 3760 | 95 16 14 | 3750 | 94 0 20 | 3741 |
| | SUN E. | 139 26 9 | 3404 | 138 3 57 | 3394 | 136 41 34 | 3386 | 135 19 2 | 3377 |
| 28 | Pollux W. | 99 1 14 | 2937 | 100 32 46 | 2928 | 102 4 29 | 2920 | 103 36 23 | 2910 |
| | Regulus W. | 62 52 47 | 2946 | 64 24 8 | 2937 | 65 55 40 | 2927 | 67 27 24 | 2918 |
| | SATURN W. | 47 0 42 | 2911 | 48 32 47 | 2902 | 50 5 3 | 2893 | 51 37 31 | 2883 |
| | Antares E. | 37 48 55 | 2969 | 36 18 4 | 2964 | 34 47 6 | 2958 | 33 16 1 | 2954 |
| | VENUS E. | 82 13 38 | 3357 | 80 50 32 | 3347 | 79 27 15 | 3338 | 78 3 48 | 3330 |
| | α Aquilæ E. | 87 38 31 | 3702 | 86 21 46 | 3696 | 85 4 55 | 3692 | 83 47 59 | 3687 |
| | SUN E. | 128 23 42 | 3330 | 127 0 5 | 3319 | 125 36 15 | 3309 | 124 12 14 | 3298 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|----|------------|----------------|------------|----------------|------------|----------------|------------|----------------|
| 21 | Pollux | W. | 21° 47' 3" | 3110 | 23° 15' 0" | 3105 | 24° 43' 3" | 3103 | 26° 11' 9" | 3100 |
| | SATURN | E. | 31 10 43 | 3050 | 29 41 32 | 3053 | 28 12 25 | 3057 | 26 43 23 | 3069 |
| | Spica | E. | 69 5 6 | 3082 | 67 36 35 | 3086 | 66 8 8 | 3087 | 64 39 43 | 3091 |
| | Antares | E. | 114 58 35 | 3075 | 113 29 55 | 3077 | 112 1 17 | 3078 | 110 32 41 | 3080 |
| 22 | α Arietis | W. | 107 59 40 | 3191 | 109 26 0 | 3193 | 110 52 17 | 3197 | 112 18 30 | 3200 |
| | Aldebaran | W. | 77 41 9 | 3088 | 79 9 33 | 3088 | 80 37 57 | 3089 | 82 6 20 | 3090 |
| | Pollux | W. | 33 32 15 | 3094 | 35 0 32 | 3092 | 36 28 51 | 3091 | 37 57 11 | 3091 |
| | Spica | E. | 57 18 24 | 3101 | 55 50 16 | 3103 | 54 22 10 | 3105 | 52 54 6 | 3106 |
| | Antares | E. | 103 10 4 | 3085 | 101 41 36 | 3086 | 100 13 9 | 3085 | 98 44 42 | 3087 |
| 23 | Aldebaran | W. | 89 28 11 | 3089 | 90 56 34 | 3089 | 92 24 57 | 3087 | 93 53 22 | 3087 |
| | Pollux | W. | 45 19 9 | 3086 | 46 47 36 | 3084 | 48 16 5 | 3089 | 49 44 36 | 3089 |
| | Spica | E. | 45 34 18 | 3115 | 44 6 27 | 3117 | 42 38 38 | 3119 | 41 10 52 | 3121 |
| | Antares | E. | 91 22 31 | 3086 | 89 54 4 | 3085 | 88 25 36 | 3084 | 86 57 7 | 3084 |
| 24 | Aldebaran | W. | 101 15 40 | 3082 | 102 44 12 | 3079 | 104 12 47 | 3078 | 105 41 23 | 3078 |
| | Pollux | W. | 57 7 37 | 3073 | 58 36 20 | 3070 | 60 5 6 | 3068 | 61 33 55 | 3065 |
| | Regulus | W. | 21 15 55 | 3156 | 22 42 57 | 3143 | 24 10 14 | 3133 | 25 37 44 | 3129 |
| | Spica | E. | 33 52 45 | 3136 | 32 25 19 | 3140 | 30 57 58 | 3146 | 29 30 44 | 3152 |
| | Antares | E. | 79 34 27 | 3077 | 78 5 49 | 3076 | 76 37 10 | 3074 | 75 8 29 | 3079 |
| | VENUS | E. | 120 12 28 | 3503 | 118 52 7 | 3500 | 117 31 43 | 3498 | 116 11 17 | 3495 |
| 25 | Aldebaran | W. | 113 5 4 | 3065 | 114 33 57 | 3061 | 116 2 54 | 3058 | 117 31 55 | 3056 |
| | Pollux | W. | 68 58 49 | 3051 | 70 27 59 | 3047 | 71 57 14 | 3043 | 73 26 33 | 3039 |
| | Regulus | W. | 32 57 55 | 3084 | 34 26 24 | 3078 | 35 55 0 | 3072 | 37 23 44 | 3066 |
| | Spica | E. | 22 16 59 | 3209 | 20 51 0 | 3230 | 19 25 26 | 3258 | 18 0 25 | 3292 |
| | Antares | E. | 67 44 20 | 3060 | 66 15 21 | 3056 | 64 46 18 | 3053 | 63 17 11 | 3050 |
| | VENUS | E. | 109 28 13 | 3479 | 108 7 25 | 3475 | 106 46 33 | 3471 | 105 25 36 | 3466 |
| 26 | Pollux | W. | 80 54 27 | 3017 | 82 24 19 | 3011 | 83 54 18 | 3006 | 85 24 23 | 3000 |
| | Regulus | W. | 44 49 18 | 3034 | 46 18 48 | 3028 | 47 48 26 | 3022 | 49 18 11 | 3015 |
| | SATURN | W. | 28 48 39 | 3002 | 30 18 49 | 2995 | 31 49 8 | 2988 | 33 19 36 | 2981 |
| | Antares | E. | 55 50 31 | 3030 | 54 20 56 | 3026 | 52 51 16 | 3022 | 51 21 30 | 3018 |
| | VENUS | E. | 98 39 35 | 3442 | 97 18 6 | 3437 | 95 56 31 | 3430 | 94 34 48 | 3424 |
| | α Aquilæ | E. | 102 47 32 | 3821 | 101 32 52 | 3808 | 100 17 58 | 3794 | 99 2 50 | 3783 |
| 27 | Pollux | W. | 92 56 44 | 2968 | 94 27 37 | 2960 | 95 58 40 | 2953 | 97 29 52 | 2945 |
| | Regulus | W. | 56 49 9 | 2979 | 58 19 48 | 2971 | 59 50 37 | 2962 | 61 21 37 | 2954 |
| | SATURN | W. | 40 54 9 | 2944 | 42 25 32 | 2936 | 43 57 5 | 2928 | 45 28 48 | 2920 |
| | Antares | E. | 43 51 11 | 2991 | 42 20 47 | 2986 | 40 50 17 | 2980 | 39 19 39 | 2975 |
| | VENUS | E. | 87 44 27 | 3389 | 86 21 58 | 3382 | 84 59 21 | 3373 | 83 36 34 | 3365 |
| | α Aquilæ | E. | 92 44 16 | 3731 | 91 28 2 | 3724 | 90 11 40 | 3715 | 88 55 9 | 3709 |
| | SUN | E. | 133 56 19 | 3368 | 132 33 26 | 3359 | 131 10 23 | 3349 | 129 47 8 | 3339 |
| 28 | Pollux | W. | 105 8 29 | 2901 | 106 40 46 | 2891 | 108 13 16 | 2889 | 109 45 58 | 2879 |
| | Regulus | W. | 68 59 20 | 2909 | 70 31 28 | 2898 | 72 3 49 | 2888 | 73 36 23 | 2878 |
| | SATURN | W. | 53 10 12 | 2873 | 54 43 5 | 2864 | 56 16 10 | 2854 | 57 49 28 | 2843 |
| | Antares | E. | 31 44 50 | 2949 | 30 13 33 | 2944 | 28 42 10 | 2940 | 27 10 42 | 2936 |
| | VENUS | E. | 76 40 9 | 3319 | 75 16 20 | 3308 | 73 52 18 | 3298 | 72 28 4 | 3288 |
| | α Aquilæ | E. | 82 30 58 | 3683 | 81 13 53 | 3680 | 79 56 45 | 3677 | 78 39 34 | 3677 |
| | SUN | E. | 122 48 0 | 3287 | 121 23 33 | 3276 | 119 58 53 | 3264 | 118 33 59 | 3253 |

AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | Sideral Time of Semi-diameter Passing Meridian | Equation of Time, to be Added to Apparent Time. | Diff. for 1 Hour. |
|------------------|-------------------|--|-------------------|-----------------------|-------------------|----------------|--|---|--------------------|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | Semi-diameter. | | | |
| SUN. | 1 | ^h 22 ^m 48 ^s 35.61 | 9.362 | S. 7° 34' 33.5" | +56.98 | 16' 10.48" | 65.44 | ^m 12 32.82 | ^s 0.494 |
| Mon. | 2 | 22 52 20.04 | 9.342 | 7 11 42.8 | 57.26 | 16 10.23 | 65.37 | 12 20.73 | 0.514 |
| Tues. | 3 | 22 56 3.99 | 9.322 | 6 48 46.0 | 57.49 | 16 9.98 | 65.30 | 12 8.16 | 0.534 |
| Wed. | 4 | 22 59 47.48 | 9.304 | 6 25 43.3 | +57.72 | 16 9.73 | 65.23 | 11 55.14 | 0.552 |
| Thur. | 5 | 23 3 30.54 | 9.286 | 6 2 35.2 | 57.94 | 16 9.47 | 65.16 | 11 41.68 | 0.570 |
| Frid. | 6 | 23 7 13.18 | 9.268 | 5 39 22.0 | 58.14 | 16 9.21 | 65.10 | 11 27.81 | 0.587 |
| Sat. | 7 | 23 10 55.42 | 9.252 | 5 16 4.1 | +58.33 | 16 8.95 | 65.04 | 11 13.53 | 0.603 |
| SUN. | 8 | 23 14 37.27 | 9.236 | 4 52 42.0 | 58.50 | 16 8.69 | 64.98 | 10 58.87 | 0.619 |
| Mon. | 9 | 23 18 18.74 | 9.221 | 4 29 16.0 | 58.66 | 16 8.43 | 64.93 | 10 43.83 | 0.634 |
| Tues. | 10 | 23 21 59.87 | 9.207 | 4 5 46.5 | +58.79 | 16 8.17 | 64.88 | 10 28.45 | 0.648 |
| Wed. | 11 | 23 25 40.67 | 9.193 | 3 42 14.0 | 58.91 | 16 7.91 | 64.83 | 10 12.73 | 0.662 |
| Thur. | 12 | 23 29 21.14 | 9.180 | 3 18 38.9 | 59.01 | 16 7.65 | 64.78 | 9 56.69 | 0.675 |
| Frid. | 13 | 23 33 1.30 | 9.167 | 2 55 1.5 | +59.10 | 16 7.39 | 64.74 | 9 40.34 | 0.688 |
| Sat. | 14 | 23 36 41.18 | 9.155 | 2 31 22.3 | 59.17 | 16 7.13 | 64.70 | 9 23.71 | 0.700 |
| SUN. | 15 | 23 40 20.78 | 9.145 | 2 7 41.6 | 59.22 | 16 6.86 | 64.66 | 9 6.80 | 0.711 |
| Mon. | 16 | 23 44 0.13 | 9.135 | 1 43 59.9 | +59.25 | 16 6.60 | 64.63 | 8 49.64 | 0.721 |
| Tues. | 17 | 23 47 39.25 | 9.125 | 1 20 17.5 | 59.26 | 16 6.33 | 64.60 | 8 32.27 | 0.730 |
| Wed. | 18 | 23 51 18.17 | 9.117 | 0 56 34.7 | 59.27 | 16 6.07 | 64.57 | 8 14.68 | 0.738 |
| Thur. | 19 | 23 54 56.88 | 9.110 | 0 32 52.0 | +59.27 | 16 5.80 | 64.55 | 7 56.88 | 0.745 |
| Frid. | 20 | 23 58 35.43 | 9.104 | S. 0 9 9.8 | 59.25 | 16 5.53 | 64.53 | 7 38.92 | 0.751 |
| Sat. | 21 | 0 2 13.83 | 9.098 | N. 0 14 31.7 | 59.21 | 16 5.26 | 64.51 | 7 20.83 | 0.757 |
| SUN. | 22 | 0 5 52.12 | 9.093 | 0 38 12.0 | +59.16 | 16 4.99 | 64.49 | 7 2.61 | 0.762 |
| Mon. | 23 | 0 9 30.30 | 9.089 | 1 1 50.8 | 59.09 | 16 4.72 | 64.48 | 6 44.29 | 0.766 |
| Tues. | 24 | 0 13 8.40 | 9.087 | 1 25 27.7 | 59.01 | 16 4.44 | 64.48 | 6 25.89 | 0.768 |
| Wed. | 25 | 0 16 46.44 | 9.085 | 1 49 2.5 | +58.91 | 16 4.16 | 64.47 | 6 7.42 | 0.769 |
| Thur. | 26 | 0 20 24.46 | 9.084 | 2 12 34.9 | 58.80 | 16 3.88 | 64.47 | 5 48.94 | 0.770 |
| Frid. | 27 | 0 24 2.48 | 9.084 | 2 36 4.5 | 58.67 | 16 3.60 | 64.47 | 5 30.46 | 0.771 |
| Sat. | 28 | 0 27 40.51 | 9.086 | 2 59 30.9 | +58.53 | 16 3.32 | 64.47 | 5 11.99 | 0.769 |
| SUN. | 29 | 0 31 18.58 | 9.088 | 3 22 53.9 | 58.38 | 16 3.04 | 64.48 | 4 53.56 | 0.767 |
| Mon. | 30 | 0 34 56.72 | 9.091 | 3 46 13.1 | 58.22 | 16 2.76 | 64.49 | 4 35.20 | 0.764 |
| Tues. | 31 | 0 38 34.95 | 9.095 | 4 9 28.2 | 58.04 | 16 2.47 | 64.50 | 4 16.93 | 0.760 |
| Wed. | 32 | 0 42 13.28 | 9.100 | N. 4 32 38.8 | +57.85 | 16 2.19 | 64.51 | 3 58.76 | 0.755 |

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.18 from the sideral time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

| AT GREENWICH MEAN NOON. | | | | | | | | | |
|--|-------------------|--|-------------------|--|-------------------|--|-------------------|---|--|
| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, to be Subtracted from Mean Time. | Diff. for 1 Hour. | Sidereal Time, or Right Ascension of Mean Sun. | |
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | | | | |
| | | ^h ^m ^s | ^s | [°] ['] [″] | [″] | ^m ^s | ^s | ^h ^m ^s | |
| SUN. | 1 | 22 48 33.65 | 9.363 | S. 7 34' 45.4 | +56.96 | 12 32.92 | 0.494 | 22 36 0.73 | |
| Mon. | 2 | 22 52 18.11 | 9.343 | 7 11 54.6 | 57.25 | 12 20.83 | 0.514 | 22 39 57.28 | |
| Tues. | 3 | 22 56 2.10 | 9.323 | 6 48 57.6 | 57.50 | 12 8.26 | 0.534 | 22 43 53.84 | |
| Wed. | 4 | 22 59 45.63 | 9.305 | 6 25 54.8 | +57.73 | 11 55.24 | 0.552 | 22 47 50.39 | |
| Thur. | 5 | 23 3 28.73 | 9.287 | 6 2 46.5 | 57.95 | 11 41.79 | 0.570 | 22 51 46.94 | |
| Frid. | 6 | 23 7 11.41 | 9.270 | 5 39 33.1 | 58.15 | 11 27.92 | 0.587 | 22 55 43.49 | |
| Sat. | 7 | 23 10 53.69 | 9.254 | 5 16 15.0 | +58.34 | 11 13.64 | 0.603 | 22 59 40.05 | |
| SUN. | 8 | 23 14 35.58 | 9.238 | 4 52 52.7 | 58.51 | 10 58.98 | 0.619 | 23 3 36.60 | |
| Mon. | 9 | 23 18 17.10 | 9.223 | 4 29 26.5 | 58.67 | 10 43.94 | 0.634 | 23 7 33.16 | |
| Tues. | 10 | 23 21 58.27 | 9.209 | 4 5 56.8 | +58.80 | 10 28.56 | 0.648 | 23 11 29.71 | |
| Wed. | 11 | 23 25 39.11 | 9.195 | 3 42 24.1 | 58.92 | 10 12.84 | 0.662 | 23 15 26.27 | |
| Thur. | 12 | 23 29 19.62 | 9.182 | 3 18 48.7 | 59.02 | 9 56.80 | 0.675 | 23 19 22.82 | |
| Frid. | 13 | 23 32 59.82 | 9.169 | 2 55 11.0 | +59.11 | 9 40.45 | 0.688 | 23 23 19.37 | |
| Sat. | 14 | 23 36 39.74 | 9.157 | 2 31 31.5 | 59.18 | 9 23.82 | 0.700 | 23 27 15.92 | |
| SUN. | 15 | 23 40 19.39 | 9.146 | 2 7 50.6 | 59.23 | 9 6.91 | 0.711 | 23 31 12.48 | |
| Mon. | 16 | 23 43 58.78 | 9.136 | 1 44 8.6 | +59.25 | 8 49.75 | 0.721 | 23 35 9.03 | |
| Tues. | 17 | 23 47 37.95 | 9.127 | 1 20 25.9 | 59.27 | 8 32.37 | 0.730 | 23 39 5.58 | |
| Wed. | 18 | 23 51 16.91 | 9.119 | 0 56 42.9 | 59.28 | 8 14.78 | 0.738 | 23 43 2.13 | |
| Thur. | 19 | 23 54 55.67 | 9.112 | 0 32 59.9 | +59.28 | 7 56.98 | 0.745 | 23 46 58.69 | |
| Frid. | 20 | 23 58 34.26 | 9.106 | S. 0 9 17.4 | 59.26 | 7 39.02 | 0.751 | 23 50 55.24 | |
| Sat. | 21 | 0 2 12.71 | 9.100 | N. 0 14 24.4 | 59.22 | 7 20.92 | 0.757 | 23 54 51.79 | |
| SUN. | 22 | 0 5 51.04 | 9.095 | 0 38 5.0 | +59.17 | 7 2.70 | 0.762 | 23 58 48.34 | |
| Mon. | 23 | 0 9 29.27 | 9.092 | 1 1 44.0 | 59.10 | 6 44.37 | 0.766 | 0 2 44.90 | |
| Tues. | 24 | 0 13 7.42 | 9.089 | 1 25 21.3 | 59.02 | 6 25.97 | 0.768 | 0 6 41.45 | |
| Wed. | 25 | 0 16 45.51 | 9.087 | 1 48 56.5 | +58.92 | 6 7.50 | 0.769 | 0 10 38.01 | |
| Thur. | 26 | 0 20 23.58 | 9.086 | 2 12 29.2 | 58.81 | 5 49.02 | 0.770 | 0 14 34.56 | |
| Frid. | 27 | 0 24 1.64 | 9.086 | 2 35 59.1 | 58.68 | 5 30.53 | 0.771 | 0 18 31.11 | |
| Sat. | 28 | 0 27 39.72 | 9.088 | 2 59 25.9 | +58.54 | 5 12.06 | 0.769 | 0 22 27.66 | |
| SUN. | 29 | 0 31 17.84 | 9.090 | 3 22 49.2 | 58.39 | 4 53.62 | 0.767 | 0 26 24.22 | |
| Mon. | 30 | 0 34 56.03 | 9.093 | 3 46 8.7 | 58.23 | 4 35.26 | 0.764 | 0 30 20.77 | |
| Tues. | 31 | 0 38 34.30 | 9.097 | 4 9 24.1 | 58.05 | 4 16.98 | 0.760 | 0 34 17.32 | |
| Wed. | 32 | 0 42 12.68 | 9.102 | N. 4 32 55.0 | +57.86 | 3 58.81 | 0.755 | 0 38 13.87 | |
| NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing. | | | | | | | | Diff. for 1 Hour, +9 ^s .8565. (Table III.) | |

| AT GREENWICH MEAN NOON. | | | | | | | | |
|--|------------------|-----------------|------------|-------------------|-----------|--|-------------------|---|
| Day of the Month. | Day of the Year. | THE SUN'S | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 Hour. | Mean Time of Sidereal Noon. |
| | | TRUE LONGITUDE. | | Diff. for 1 Hour. | LATITUDE. | | | |
| | | λ | λ' | | | | | |
| 1 | 60 | 340° 39' 9.4 | 39' 16.5 | 150.43 | + 0.26 | 9.9961859 | +46.5 | ^h 1 ^m 23 ^s 45.51 |
| 2 | 61 | 341 39 18.8 | 39 25.8 | 150.37 | + 0.13 | 9.9962982 | 47.0 | 1 19 49.60 |
| 3 | 62 | 342 39 26.6 | 39 33.5 | 150.30 | — 0.01 | 9.9964116 | 47.5 | 1 15 53.69 |
| 4 | 63 | 343 39 32.9 | 39 39.7 | 150.23 | — 0.13 | 9.9965260 | +47.9 | 1 11 57.78 |
| 5 | 64 | 344 39 37.6 | 39 44.3 | 150.16 | 0.25 | 9.9966412 | 48.2 | 1 8 1.88 |
| 6 | 65 | 345 39 40.7 | 39 47.3 | 150.09 | 0.36 | 9.9967571 | 48.4 | 1 4 5.98 |
| 7 | 66 | 346 39 42.2 | 39 48.7 | 150.03 | — 0.44 | 9.9968735 | +48.6 | 1 0 10.07 |
| 8 | 67 | 347 39 41.9 | 39 48.3 | 149.96 | 0.49 | 9.9969903 | 48.7 | 0 56 14.16 |
| 9 | 68 | 348 39 39.8 | 39 46.1 | 149.88 | 0.51 | 9.9971074 | 48.8 | 0 52 18.25 |
| 10 | 69 | 349 39 35.8 | 39 42.0 | 149.80 | — 0.51 | 9.9972247 | +48.9 | 0 48 22.34 |
| 11 | 70 | 350 39 29.9 | 39 36.0 | 149.71 | 0.48 | 9.9973422 | 49.0 | 0 44 26.43 |
| 12 | 71 | 351 39 21.9 | 39 27.9 | 149.62 | 0.41 | 9.9974598 | 49.0 | 0 40 30.52 |
| 13 | 72 | 352 39 11.8 | 39 17.7 | 149.53 | — 0.32 | 9.9975776 | +49.1 | 0 36 34.62 |
| 14 | 73 | 353 38 59.6 | 39 5.4 | 149.44 | 0.21 | 9.9976956 | 49.2 | 0 32 38.71 |
| 15 | 74 | 354 38 45.2 | 38 50.9 | 149.35 | — 0.09 | 9.9978138 | 49.3 | 0 28 42.80 |
| 16 | 75 | 355 38 28.5 | 38 34.1 | 149.26 | + 0.04 | 9.9979322 | +49.4 | 0 24 46.89 |
| 17 | 76 | 356 38 9.5 | 38 15.0 | 149.16 | 0.19 | 9.9980510 | 49.6 | 0 20 50.99 |
| 18 | 77 | 357 37 48.2 | 37 53.6 | 149.07 | 0.32 | 9.9981703 | 49.8 | 0 16 55.09 |
| 19 | 78 | 358 37 24.7 | 37 30.0 | 148.97 | + 0.43 | 9.9982902 | +50.0 | 0 12 59.18 |
| 20 | 79 | 359 36 58.9 | 37 4.1 | 148.88 | 0.52 | 9.9984107 | 50.3 | 0 9 3.28 |
| 21 | 80 | 0 36 30.8 | 36 35.8 | 148.78 | 0.59 | 9.9985320 | 50.7 | 0 5 7.37 |
| 22 | 81 | 1 36 0.4 | 36 5.3 | 148.69 | + 0.64 | 9.9986541 | +51.0 | { 0 1 11.46 } |
| 23 | 82 | 2 35 27.8 | 35 32.6 | 148.60 | 0.65 | 9.9987770 | 51.3 | { 23 57 15.55 } |
| 24 | 83 | 3 34 53.1 | 34 57.8 | 148.51 | 0.63 | 9.9989007 | 51.6 | 23 53 19.64 |
| 25 | 84 | 4 34 16.3 | 34 20.9 | 148.43 | + 0.59 | 9.9990252 | +52.0 | 23 45 27.82 |
| 26 | 85 | 5 33 37.5 | 33 42.0 | 148.34 | 0.52 | 9.9991506 | 52.4 | 23 41 31.91 |
| 27 | 86 | 6 32 56.7 | 33 1.1 | 148.26 | 0.43 | 9.9992768 | 52.7 | 23 37 36.01 |
| 28 | 87 | 7 32 13.9 | 32 18.2 | 148.18 | + 0.31 | 9.9994037 | +53.0 | 23 33 40.11 |
| 29 | 88 | 8 31 29.3 | 31 33.5 | 148.10 | 0.18 | 9.9995312 | 53.2 | 23 29 44.20 |
| 30 | 89 | 9 30 42.9 | 30 47.0 | 148.02 | + 0.05 | 9.9996590 | 53.3 | 23 25 48.29 |
| 31 | 90 | 10 29 54.7 | 29 58.7 | 147.95 | — 0.08 | 9.9997871 | 53.4 | 23 21 52.39 |
| 32 | 91 | 11 29 4.7 | 29 8.6 | 147.88 | — 0.20 | 9.9999155 | +53.4 | 23 17 56.48 |
| NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^h .0. | | | | | | | | |
| | | | | | | | | Diff. for 1 Hour, — 9 ^s .8296. (Table II.) |

GREENWICH MEAN TIME.

THE MOON'S

| Day of the Month. | SEMI- DIAMETER. | | HORIZONTAL PARALLAX. | | | | UPPER TRANSIT. | | AGE. |
|-------------------|-----------------|-----------|----------------------|-------------------|-----------|-------------------|---------------------------|-------------------|--------------|
| | Noon. | Midnight. | Noon. | Diff. for 1 Hour. | Midnight. | Diff. for 1 Hour. | Meridian of Greenwich. | Diff. for 1 Hour. | Noon. |
| | | | | | | | ^h ^m | ^m | ^d |
| 1 | 15' 9.5 | 15' 14.6 | 55' 31.1 | +1.48 | 55' 49.8 | +1.63 | 16 41.9 | 1.97 | 20.4 |
| 2 | 15 20.1 | 15 26.2 | 56 10.2 | 1.78 | 56 32.4 | 1.92 | 17 31.1 | 2.14 | 21.4 |
| 3 | 15 32.6 | 15 39.5 | 56 56.2 | 2.04 | 57 21.4 | 2.14 | 18 24.5 | 2.31 | 22.4 |
| 4 | 15 46.7 | 15 54.0 | 57 47.7 | +2.23 | 58 14.8 | +2.28 | 19 22.1 | 2.46 | 23.4 |
| 5 | 16 1.5 | 16 8.9 | 58 42.2 | 2.28 | 59 9.4 | 2.24 | 20 22.8 | 2.55 | 24.4 |
| 6 | 16 16.1 | 16 22.9 | 59 35.8 | 2.14 | 60 0.8 | 2.00 | 21 24.6 | 2.55 | 25.4 |
| 7 | 16 29.1 | 16 34.6 | 60 23.7 | +1.79 | 60 43.7 | +1.52 | 22 25.4 | 2.48 | 26.4 |
| 8 | 16 39.1 | 16 42.5 | 61 0.2 | 1.21 | 61 12.6 | 0.84 | 23 23.7 | 2.37 | 27.4 |
| 9 | 16 44.6 | 16 45.4 | 61 20.4 | +0.45 | 61 23.3 | +0.03 | 6 | | 28.4 |
| 10 | 16 44.8 | 16 42.8 | 61 21.1 | -0.40 | 61 13.8 | -0.81 | 0 19.3 | 2.27 | 0.0 |
| 11 | 16 39.5 | 16 35.0 | 61 1.7 | 1.20 | 60 45.1 | 1.54 | 1 12.5 | 2.19 | 1.0 |
| 12 | 16 29.4 | 16 23.0 | 60 24.7 | 1.83 | 60 1.1 | 2.07 | 2 4.4 | 2.15 | 2.0 |
| 13 | 16 15.9 | 16 8.3 | 59 35.0 | -2.25 | 59 7.1 | -2.37 | 2 55.5 | 2.14 | 3.0 |
| 14 | 16 0.4 | 15 52.4 | 58 38.1 | 2.43 | 58 8.8 | 2.44 | 3 47.1 | 2.16 | 4.0 |
| 15 | 15 44.5 | 15 36.8 | 57 39.7 | 2.39 | 57 11.4 | 2.31 | 4 39.4 | 2.20 | 5.0 |
| 16 | 15 29.4 | 15 22.5 | 56 44.3 | -2.19 | 56 18.8 | -2.05 | 5 32.5 | 2.22 | 6.0 |
| 17 | 15 16.0 | 15 10.1 | 55 55.1 | 1.89 | 55 33.5 | 1.71 | 6 25.8 | 2.21 | 7.0 |
| 18 | 15 4.8 | 15 0.2 | 55 14.1 | 1.52 | 54 57.0 | 1.33 | 7 18.4 | 2.16 | 8.0 |
| 19 | 14 56.1 | 14 52.7 | 54 42.1 | -1.14 | 54 29.6 | -0.95 | 8 9.4 | 2.08 | 9.0 |
| 20 | 14 49.9 | 14 47.7 | 54 19.3 | 0.77 | 54 11.2 | 0.59 | 8 58.2 | 1.98 | 10.0 |
| 21 | 14 46.1 | 14 44.9 | 54 5.1 | 0.43 | 54 1.0 | -0.26 | 9 44.5 | 1.88 | 11.0 |
| 22 | 14 44.3 | 14 44.2 | 53 58.8 | -0.11 | 53 58.3 | +0.03 | 10 28.4 | 1.79 | 12.0 |
| 23 | 14 44.5 | 14 45.2 | 53 59.4 | +0.16 | 54 2.0 | 0.28 | 11 10.5 | 1.73 | 13.0 |
| 24 | 14 46.3 | 14 47.8 | 54 6.1 | 0.39 | 54 11.4 | 0.49 | 11 51.4 | 1.69 | 14.0 |
| 25 | 14 49.5 | 14 51.6 | 54 17.9 | +0.59 | 54 25.5 | +0.68 | 12 31.8 | 1.70 | 15.0 |
| 26 | 14 54.0 | 14 56.7 | 54 34.3 | 0.78 | 54 44.1 | 0.86 | 13 12.8 | 1.73 | 16.0 |
| 27 | 14 59.6 | 15 2.9 | 54 54.9 | 0.95 | 55 6.8 | 1.04 | 13 55.1 | 1.81 | 17.0 |
| 28 | 15 6.4 | 15 10.2 | 55 19.8 | +1.13 | 55 33.8 | +1.21 | 14 39.8 | 1.93 | 18.0 |
| 29 | 15 14.3 | 15 18.7 | 55 48.8 | 1.30 | 56 5.0 | 1.39 | 15 27.6 | 2.07 | 19.0 |
| 30 | 15 23.4 | 15 28.4 | 56 22.3 | 1.48 | 56 40.6 | 1.57 | 16 19.1 | 2.22 | 20.0 |
| 31 | 15 33.7 | 15 39.2 | 56 59.9 | 1.65 | 57 20.2 | 1.72 | 17 14.4 | 2.36 | 21.0 |
| 32 | 15 44.9 | 15 50.8 | 57 41.2 | +1.78 | 58 2.8 | +1.82 | 18 12.4 | 2.45 | 22.0 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-----------|------------------|---------------------|-----------------|---------------------|--------------|------------------|---------------------|-----------------|---------------------|
| SUNDAY 1. | | | | | TUESDAY 3. | | | | |
| 0 | 14 46 49.09 | 1.9801 | S. 13° 46' 37.9 | 11.543 | 0 | 16 28 27.88 | 2.2713 | S. 21° 43' 11.7 | 7.855 |
| 1 | 14 48 48.04 | 1.9850 | 13 58 9.0 | 11.493 | 1 | 16 30 44.36 | 2.2781 | 21 50 59.8 | 7.748 |
| 2 | 14 50 47.29 | 1.9900 | 14 9 37.1 | 11.449 | 2 | 16 33 1.25 | 2.2850 | 21 58 41.5 | 7.640 |
| 3 | 14 52 46.84 | 1.9950 | 14 21 2.1 | 11.397 | 3 | 16 35 18.56 | 2.2919 | 22 6 16.6 | 7.539 |
| 4 | 14 54 46.69 | 2.0000 | 14 32 23.9 | 11.337 | 4 | 16 37 36.28 | 2.2987 | 22 13 45.0 | 7.417 |
| 5 | 14 56 46.84 | 2.0051 | 14 43 42.5 | 11.289 | 5 | 16 39 54.41 | 2.3055 | 22 21 6.7 | 7.305 |
| 6 | 14 58 47.30 | 2.0103 | 14 54 57.7 | 11.236 | 6 | 16 42 12.94 | 2.3123 | 22 28 21.6 | 7.191 |
| 7 | 15 0 48.08 | 2.0156 | 15 6 9.6 | 11.170 | 7 | 16 44 31.88 | 2.3192 | 22 35 29.6 | 7.075 |
| 8 | 15 2 49.18 | 2.0210 | 15 17 18.1 | 11.119 | 8 | 16 46 51.24 | 2.3260 | 22 42 30.6 | 6.958 |
| 9 | 15 4 50.60 | 2.0263 | 15 28 23.1 | 11.054 | 9 | 16 49 11.00 | 2.3328 | 22 49 24.6 | 6.841 |
| 10 | 15 6 52.34 | 2.0317 | 15 39 24.6 | 10.993 | 10 | 16 51 31.17 | 2.3396 | 22 56 11.5 | 6.721 |
| 11 | 15 8 54.41 | 2.0373 | 15 50 22.5 | 10.934 | 11 | 16 53 51.75 | 2.3464 | 23 2 51.1 | 6.599 |
| 12 | 15 10 56.82 | 2.0429 | 16 1 16.7 | 10.872 | 12 | 16 56 12.74 | 2.3532 | 23 9 23.4 | 6.477 |
| 13 | 15 12 59.56 | 2.0485 | 16 12 7.1 | 10.809 | 13 | 16 58 34.13 | 2.3599 | 23 15 48.4 | 6.354 |
| 14 | 15 15 2.64 | 2.0542 | 16 22 53.8 | 10.746 | 14 | 17 0 55.92 | 2.3666 | 23 22 5.9 | 6.238 |
| 15 | 15 17 6.06 | 2.0598 | 16 33 36.6 | 10.680 | 15 | 17 3 18.12 | 2.3733 | 23 28 15.8 | 6.109 |
| 16 | 15 19 9.82 | 2.0656 | 16 44 15.4 | 10.613 | 16 | 17 5 40.72 | 2.3799 | 23 34 18.1 | 5.975 |
| 17 | 15 21 13.93 | 2.0714 | 16 54 50.2 | 10.546 | 17 | 17 8 3.71 | 2.3865 | 23 40 12.8 | 5.847 |
| 18 | 15 23 18.39 | 2.0772 | 17 5 20.9 | 10.477 | 18 | 17 10 27.10 | 2.3931 | 23 45 59.7 | 5.716 |
| 19 | 15 25 23.20 | 2.0832 | 17 15 47.4 | 10.408 | 19 | 17 12 50.88 | 2.3997 | 23 51 38.7 | 5.584 |
| 20 | 15 27 28.37 | 2.0892 | 17 26 9.8 | 10.338 | 20 | 17 15 15.06 | 2.4062 | 23 57 9.8 | 5.452 |
| 21 | 15 29 33.90 | 2.0952 | 17 36 28.0 | 10.267 | 21 | 17 17 39.63 | 2.4127 | 24 2 32.9 | 5.318 |
| 22 | 15 31 39.79 | 2.1013 | 17 46 41.8 | 10.193 | 22 | 17 20 4.58 | 2.4191 | 24 7 47.9 | 5.189 |
| 23 | 15 33 46.05 | 2.1074 | S. 17° 56' 51.1 | 10.118 | 23 | 17 22 29.92 | 2.4255 | S. 24° 12' 54.7 | 5.044 |
| MONDAY 2. | | | | | WEDNESDAY 4. | | | | |
| 0 | 15 35 52.68 | 2.1136 | S. 18° 6' 55.9 | 10.043 | 0 | 17 24 55.64 | 2.4318 | S. 24° 17' 53.2 | 4.906 |
| 1 | 15 37 59.68 | 2.1197 | 18 16 56.2 | 9.967 | 1 | 17 27 21.74 | 2.4381 | 24 22 43.4 | 4.767 |
| 2 | 15 40 7.05 | 2.1259 | 18 26 51.9 | 9.888 | 2 | 17 29 48.21 | 2.4443 | 24 27 25.2 | 4.627 |
| 3 | 15 42 14.79 | 2.1322 | 18 36 42.8 | 9.808 | 3 | 17 32 15.06 | 2.4506 | 24 31 58.6 | 4.485 |
| 4 | 15 44 22.91 | 2.1386 | 18 46 28.9 | 9.728 | 4 | 17 34 42.28 | 2.4567 | 24 36 23.4 | 4.341 |
| 5 | 15 46 31.42 | 2.1450 | 18 56 10.2 | 9.647 | 5 | 17 37 9.86 | 2.4627 | 24 40 39.5 | 4.196 |
| 6 | 15 48 40.31 | 2.1513 | 19 5 46.6 | 9.565 | 6 | 17 39 37.80 | 2.4687 | 24 44 46.9 | 4.050 |
| 7 | 15 50 49.58 | 2.1577 | 19 15 18.0 | 9.481 | 7 | 17 42 6.10 | 2.4746 | 24 48 45.5 | 3.903 |
| 8 | 15 52 59.24 | 2.1649 | 19 24 44.3 | 9.395 | 8 | 17 44 34.75 | 2.4805 | 24 52 35.3 | 3.756 |
| 9 | 15 55 9.29 | 2.1707 | 19 34 5.4 | 9.308 | 9 | 17 47 3.76 | 2.4863 | 24 56 16.2 | 3.607 |
| 10 | 15 57 19.73 | 2.1772 | 19 43 21.3 | 9.221 | 10 | 17 49 33.11 | 2.4920 | 24 59 48.1 | 3.456 |
| 11 | 15 59 30.56 | 2.1838 | 19 52 31.9 | 9.139 | 11 | 17 52 2.80 | 2.4976 | 25 3 10.9 | 3.304 |
| 12 | 16 1 41.79 | 2.1905 | 20 1 37.2 | 9.042 | 12 | 17 54 32.82 | 2.5031 | 25 6 24.6 | 3.159 |
| 13 | 16 3 53.42 | 2.1971 | 20 10 37.0 | 8.950 | 13 | 17 57 3.17 | 2.5086 | 25 9 29.1 | 2.998 |
| 14 | 16 6 5.44 | 2.2037 | 20 19 31.2 | 8.857 | 14 | 17 59 33.85 | 2.5140 | 25 12 24.3 | 2.843 |
| 15 | 16 8 17.86 | 2.2104 | 20 28 19.8 | 8.763 | 15 | 18 2 4.85 | 2.5193 | 25 15 10.1 | 2.685 |
| 16 | 16 10 30.69 | 2.2171 | 20 37 2.7 | 8.668 | 16 | 18 4 36.16 | 2.5245 | 25 17 46.5 | 2.528 |
| 17 | 16 12 43.92 | 2.2238 | 20 45 39.9 | 8.571 | 17 | 18 7 7.79 | 2.5297 | 25 20 13.5 | 2.370 |
| 18 | 16 14 57.55 | 2.2306 | 20 54 11.2 | 8.479 | 18 | 18 9 39.72 | 2.5348 | 25 22 30.9 | 2.210 |
| 19 | 16 17 11.59 | 2.2373 | 21 2 36.6 | 8.373 | 19 | 18 12 11.94 | 2.5396 | 25 24 38.7 | 2.050 |
| 20 | 16 19 26.03 | 2.2441 | 21 10 56.0 | 8.272 | 20 | 18 14 44.46 | 2.5443 | 25 26 36.9 | 1.889 |
| 21 | 16 21 40.88 | 2.2509 | 21 19 9.3 | 8.170 | 21 | 18 17 17.26 | 2.5490 | 25 28 25.4 | 1.737 |
| 22 | 16 23 56.14 | 2.2577 | 21 27 16.4 | 8.066 | 22 | 18 19 50.34 | 2.5537 | 25 30 4.1 | 1.583 |
| 23 | 16 26 11.81 | 2.2645 | 21 35 17.2 | 7.961 | 23 | 18 22 23.70 | 2.5582 | 25 31 32.9 | 1.398 |
| 24 | 16 28 27.88 | 2.2713 | S. 21° 43' 11.7 | 7.855 | 24 | 18 24 57.32 | 2.5625 | S. 25° 32' 51.8 | 1.233 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|---------------------|------------------|---------------------|-------------|------------------|---------------------|------------------|---------------------|
| THURSDAY 5. | | | | | SATURDAY 7. | | | | |
| 0 | 18 24 57.32 | 2.5625 | S. 25° 32' 51.8" | 1.933 | 0 | 20 30 35.96 | 2.6913 | S. 23° 11' 23.9" | 7.171 |
| 1 | 18 27 31.20 | 2.5668 | 25 34 0.8 | 1.067 | 1 | 20 33 13.18 | 2.6193 | 23 4 8.5 | 7.342 |
| 2 | 18 30 5.34 | 2.5710 | 25 34 59.8 | 0.900 | 2 | 20 35 50.28 | 2.6173 | 22 56 42.9 | 7.519 |
| 3 | 18 32 39.72 | 2.5750 | 25 35 48.8 | 0.732 | 3 | 20 38 27.26 | 2.6152 | 22 49 7.1 | 7.680 |
| 4 | 18 35 14.34 | 2.5789 | 25 36 27.7 | 0.563 | 4 | 20 41 4.11 | 2.6130 | 22 41 21.3 | 7.848 |
| 5 | 18 37 49.19 | 2.5827 | 25 36 56.4 | 0.393 | 5 | 20 43 40.82 | 2.6108 | 22 33 25.4 | 8.015 |
| 6 | 18 40 24.27 | 2.5865 | 25 37 14.9 | 0.223 | 6 | 20 46 17.38 | 2.6081 | 22 25 19.5 | 8.181 |
| 7 | 18 42 59.57 | 2.5901 | 25 37 23.2 | - 0.052 | 7 | 20 48 53.79 | 2.6055 | 22 17 3.7 | 8.346 |
| 8 | 18 45 35.08 | 2.5934 | 25 37 21.2 | + 0.119 | 8 | 20 51 30.04 | 2.6037 | 22 8 38.0 | 8.509 |
| 9 | 18 48 10.78 | 2.5967 | 25 37 8.9 | 0.999 | 9 | 20 54 6.12 | 2.5999 | 22 0 2.6 | 8.672 |
| 10 | 18 50 46.68 | 2.5999 | 25 36 46.2 | 0.465 | 10 | 20 56 42.03 | 2.5971 | 21 51 17.4 | 8.834 |
| 11 | 18 53 22.77 | 2.6030 | 25 36 13.1 | 0.638 | 11 | 20 59 17.77 | 2.5942 | 21 42 22.5 | 8.995 |
| 12 | 18 55 59.04 | 2.6059 | 25 35 29.6 | 0.812 | 12 | 21 1 53.33 | 2.5911 | 21 33 18.0 | 9.154 |
| 13 | 18 58 35.48 | 2.6087 | 25 34 35.6 | 0.987 | 13 | 21 4 28.70 | 2.5879 | 21 24 4.0 | 9.312 |
| 14 | 19 1 12.00 | 2.6114 | 25 33 31.1 | 1.162 | 14 | 21 7 3.88 | 2.5846 | 21 14 40.5 | 9.469 |
| 15 | 19 3 48.85 | 2.6139 | 25 32 16.1 | 1.338 | 15 | 21 9 38.86 | 2.5813 | 21 5 7.7 | 9.624 |
| 16 | 19 6 25.76 | 2.6163 | 25 30 50.5 | 1.514 | 16 | 21 12 13.64 | 2.5780 | 20 55 25.6 | 9.779 |
| 17 | 19 9 2.81 | 2.6186 | 25 29 14.4 | 1.690 | 17 | 21 14 48.22 | 2.5745 | 20 45 34.2 | 9.939 |
| 18 | 19 11 39.99 | 2.6207 | 25 27 27.7 | 1.867 | 18 | 21 17 22.58 | 2.5709 | 20 35 33.7 | 10.094 |
| 19 | 19 14 17.30 | 2.6227 | 25 25 30.3 | 2.045 | 19 | 21 19 56.73 | 2.5673 | 20 25 24.1 | 10.235 |
| 20 | 19 16 54.72 | 2.6246 | 25 23 22.3 | 2.223 | 20 | 21 22 30.66 | 2.5637 | 20 15 5.5 | 10.383 |
| 21 | 19 19 32.25 | 2.6263 | 25 21 3.6 | 2.401 | 21 | 21 25 4.38 | 2.5601 | 20 4 38.1 | 10.530 |
| 22 | 19 22 9.88 | 2.6279 | 25 18 34.2 | 2.579 | 22 | 21 27 37.87 | 2.5569 | 19 54 1.9 | 10.677 |
| 23 | 19 24 47.60 | 2.6293 | S. 25° 15' 54.1" | 2.757 | 23 | 21 30 11.12 | 2.5532 | S. 19° 43' 16.9" | 10.822 |
| FRIDAY 6. | | | | | SUNDAY 8. | | | | |
| 0 | 19 27 25.40 | 2.6306 | S. 25° 13' 3.4" | 2.935 | 0 | 21 32 44.14 | 2.5484 | S. 19° 32' 23.2" | 10.966 |
| 1 | 19 30 3.27 | 2.6317 | 25 10 1.9 | 3.114 | 1 | 21 35 16.93 | 2.5444 | 19 21 21.0 | 11.107 |
| 2 | 19 32 41.21 | 2.6328 | 25 6 49.7 | 3.293 | 2 | 21 37 49.47 | 2.5403 | 19 10 10.4 | 11.246 |
| 3 | 19 35 19.21 | 2.6337 | 25 3 26.8 | 3.472 | 3 | 21 40 21.77 | 2.5363 | 18 58 51.5 | 11.384 |
| 4 | 19 37 57.26 | 2.6345 | 24 59 53.1 | 3.651 | 4 | 21 42 53.83 | 2.5323 | 18 47 24.3 | 11.522 |
| 5 | 19 40 35.35 | 2.6351 | 24 56 8.7 | 3.830 | 5 | 21 45 25.64 | 2.5289 | 18 35 48.9 | 11.657 |
| 6 | 19 43 13.47 | 2.6356 | 24 52 13.6 | 4.007 | 6 | 21 47 57.21 | 2.5240 | 18 24 5.5 | 11.790 |
| 7 | 19 45 51.62 | 2.6359 | 24 48 7.8 | 4.186 | 7 | 21 50 28.52 | 2.5197 | 18 12 14.1 | 11.922 |
| 8 | 19 48 29.78 | 2.6360 | 24 43 51.3 | 4.365 | 8 | 21 52 59.58 | 2.5155 | 18 0 14.9 | 12.051 |
| 9 | 19 51 7.94 | 2.6360 | 24 39 24.0 | 4.543 | 9 | 21 55 30.38 | 2.5112 | 17 48 8.0 | 12.179 |
| 10 | 19 53 46.10 | 2.6360 | 24 34 46.1 | 4.721 | 10 | 21 58 0.92 | 2.5068 | 17 35 53.4 | 12.306 |
| 11 | 19 56 24.26 | 2.6358 | 24 29 57.5 | 4.899 | 11 | 22 0 31.20 | 2.5025 | 17 23 31.3 | 12.431 |
| 12 | 19 59 2.40 | 2.6355 | 24 24 58.2 | 5.077 | 12 | 22 3 1.22 | 2.4981 | 17 11 1.7 | 12.554 |
| 13 | 20 1 40.52 | 2.6350 | 24 19 48.3 | 5.254 | 13 | 22 5 30.97 | 2.4937 | 16 58 24.8 | 12.675 |
| 14 | 20 4 18.60 | 2.6344 | 24 14 27.7 | 5.431 | 14 | 22 8 0.46 | 2.4893 | 16 45 40.7 | 12.794 |
| 15 | 20 6 56.64 | 2.6337 | 24 8 56.5 | 5.607 | 15 | 22 10 29.09 | 2.4849 | 16 32 49.5 | 12.912 |
| 16 | 20 9 34.64 | 2.6328 | 24 3 14.8 | 5.783 | 16 | 22 12 58.65 | 2.4805 | 16 19 51.3 | 13.028 |
| 17 | 20 12 12.58 | 2.6317 | 23 57 22.5 | 5.959 | 17 | 22 15 27.35 | 2.4761 | 16 6 46.2 | 13.149 |
| 18 | 20 14 50.45 | 2.6306 | 23 51 19.7 | 6.134 | 18 | 22 17 55.78 | 2.4716 | 15 53 34.3 | 13.263 |
| 19 | 20 17 28.25 | 2.6294 | 23 45 6.4 | 6.308 | 19 | 22 20 23.94 | 2.4672 | 15 40 15.8 | 13.383 |
| 20 | 20 20 5.98 | 2.6281 | 23 38 42.7 | 6.483 | 20 | 22 22 51.84 | 2.4627 | 15 26 50.7 | 13.479 |
| 21 | 20 22 43.62 | 2.6266 | 23 32 8.5 | 6.657 | 21 | 22 25 19.46 | 2.4581 | 15 13 19.2 | 13.578 |
| 22 | 20 25 21.17 | 2.6250 | 23 25 23.9 | 6.829 | 22 | 22 27 46.81 | 2.4537 | 14 59 41.4 | 13.682 |
| 23 | 20 27 58.62 | 2.6233 | 23 18 29.0 | 7.000 | 23 | 22 30 13.90 | 2.4492 | 14 45 57.4 | 13.784 |
| 24 | 20 30 35.96 | 2.6213 | S. 23° 11' 23.9" | 7.171 | 24 | 22 32 40.72 | 2.4447 | S. 14° 32' 7.3" | 13.884 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|--|------------------------|----------------|------------------------|---------------|-------------------------|------------------------|---------------|------------------------|
| MONDAY 9. | | | | | WEDNESDAY 11. | | | | |
| 0 | ^h 22 ^m 32 ^s 40.72 | 2.4447 | S. 14° 32' 7.3 | 13.884 | 0 | ^h 0 25 25.48 | 2.2701 | S. 2° 8' 52.2 | 16.297 |
| 1 | 22 35 7.27 | 2.4403 | 14 18 11.3 | 13.982 | 1 | 0 27 41.61 | 2.2678 | 1 52 34.3 | 16.298 |
| 2 | 22 37 33.56 | 2.4359 | 14 4 9.4 | 14.079 | 2 | 0 29 57.61 | 2.2655 | 1 36 16.4 | 16.297 |
| 3 | 22 39 59.58 | 2.4315 | 13 50 1.8 | 14.173 | 3 | 0 32 13.47 | 2.2632 | 1 19 58.6 | 16.294 |
| 4 | 22 42 25.34 | 2.4271 | 13 35 48.6 | 14.266 | 4 | 0 34 29.20 | 2.2611 | 1 3 41.1 | 16.289 |
| 5 | 22 44 50.83 | 2.4227 | 13 21 29.9 | 14.356 | 5 | 0 36 44.80 | 2.2590 | 0 47 23.9 | 16.282 |
| 6 | 22 47 16.06 | 2.4183 | 13 7 5.9 | 14.443 | 6 | 0 39 0.28 | 2.2570 | 0 31 7.2 | 16.273 |
| 7 | 22 49 41.03 | 2.4140 | 12 52 36.7 | 14.530 | 7 | 0 41 15.64 | 2.2550 | S. 0 14 51.1 | 16.263 |
| 8 | 22 52 5.74 | 2.4096 | 12 38 2.3 | 14.615 | 8 | 0 43 30.88 | 2.2530 | N. 0 1 24.4 | 16.252 |
| 9 | 22 54 30.18 | 2.4053 | 12 23 22.9 | 14.697 | 9 | 0 45 46.00 | 2.2512 | 0 17 39.1 | 16.238 |
| 10 | 22 56 54.37 | 2.4010 | 12 8 38.6 | 14.777 | 10 | 0 48 1.02 | 2.2495 | 0 33 52.9 | 16.222 |
| 11 | 22 59 18.30 | 2.3967 | 11 53 49.6 | 14.855 | 11 | 0 50 15.94 | 2.2477 | 0 50 5.7 | 16.203 |
| 12 | 23 1 41.97 | 2.3924 | 11 38 56.0 | 14.931 | 12 | 0 52 30.75 | 2.2460 | 1 6 17.3 | 16.183 |
| 13 | 23 4 5.39 | 2.3882 | 11 23 57.9 | 15.005 | 13 | 0 54 45.46 | 2.2444 | 1 22 27.7 | 16.162 |
| 14 | 23 6 28.56 | 2.3842 | 11 8 55.4 | 15.077 | 14 | 0 57 0.08 | 2.2430 | 1 38 36.8 | 16.139 |
| 15 | 23 8 51.49 | 2.3801 | 10 53 48.7 | 15.147 | 15 | 0 59 14.62 | 2.2416 | 1 54 44.4 | 16.114 |
| 16 | 23 11 14.17 | 2.3759 | 10 38 37.8 | 15.215 | 16 | 1 1 29.07 | 2.2402 | 2 10 50.5 | 16.087 |
| 17 | 23 13 36.60 | 2.3718 | 10 23 22.9 | 15.280 | 17 | 1 3 43.44 | 2.2388 | 2 26 54.9 | 16.059 |
| 18 | 23 15 58.78 | 2.3677 | 10 8 4.2 | 15.343 | 18 | 1 5 57.72 | 2.2374 | 2 42 57.6 | 16.029 |
| 19 | 23 18 20.72 | 2.3637 | 9 52 41.7 | 15.405 | 19 | 1 8 11.93 | 2.2363 | 2 58 58.4 | 15.997 |
| 20 | 23 20 42.43 | 2.3598 | 9 37 15.6 | 15.465 | 20 | 1 10 26.07 | 2.2352 | 3 14 57.3 | 15.964 |
| 21 | 23 23 3.90 | 2.3550 | 9 21 45.9 | 15.522 | 21 | 1 12 40.15 | 2.2342 | 3 30 54.1 | 15.928 |
| 22 | 23 25 25.14 | 2.3511 | 9 6 12.9 | 15.577 | 22 | 1 14 54.17 | 2.2331 | 3 46 48.7 | 15.891 |
| 23 | 23 27 46.15 | 2.3483 | S. 8 50 36.6 | 15.631 | 23 | 1 17 8.12 | 2.2320 | N. 4 2 41.0 | 15.852 |
| TUESDAY 10. | | | | | THURSDAY 12. | | | | |
| 0 | 23 30 6.93 | 2.3445 | S. 8 34 57.2 | 15.682 | 0 | 1 19 22.01 | 2.2311 | N. 4 18 31.0 | 15.812 |
| 1 | 23 32 27.49 | 2.3407 | 8 19 14.8 | 15.731 | 1 | 1 21 35.85 | 2.2303 | 4 34 18.5 | 15.770 |
| 2 | 23 34 47.82 | 2.3370 | 8 3 29.5 | 15.777 | 2 | 1 23 49.65 | 2.2296 | 4 50 3.4 | 15.727 |
| 3 | 23 37 7.93 | 2.3334 | 7 47 41.5 | 15.822 | 3 | 1 26 3.40 | 2.2289 | 5 5 45.7 | 15.682 |
| 4 | 23 39 27.83 | 2.3299 | 7 31 50.8 | 15.866 | 4 | 1 28 17.11 | 2.2282 | 5 21 25.2 | 15.635 |
| 5 | 23 41 47.52 | 2.3263 | 7 15 57.6 | 15.907 | 5 | 1 30 30.78 | 2.2276 | 5 37 1.9 | 15.587 |
| 6 | 23 44 6.99 | 2.3228 | 7 0 2.0 | 15.946 | 6 | 1 32 44.42 | 2.2271 | 5 52 35.7 | 15.537 |
| 7 | 23 46 26.26 | 2.3195 | 6 44 4.1 | 15.982 | 7 | 1 34 58.03 | 2.2266 | 6 8 6.4 | 15.486 |
| 8 | 23 48 45.33 | 2.3162 | 6 28 4.1 | 16.017 | 8 | 1 37 11.61 | 2.2261 | 6 23 34.0 | 15.432 |
| 9 | 23 51 4.20 | 2.3128 | 6 12 2.1 | 16.049 | 9 | 1 39 25.16 | 2.2257 | 6 38 58.3 | 15.377 |
| 10 | 23 53 22.87 | 2.3095 | 5 55 58.2 | 16.080 | 10 | 1 41 38.69 | 2.2254 | 6 54 19.3 | 15.322 |
| 11 | 23 55 41.34 | 2.3063 | 5 39 52.5 | 16.108 | 11 | 1 43 52.21 | 2.2252 | 7 9 37.0 | 15.265 |
| 12 | 23 57 59.62 | 2.3032 | 5 23 45.2 | 16.134 | 12 | 1 46 5.71 | 2.2249 | 7 24 51.1 | 15.205 |
| 13 | 0 0 17.72 | 2.3003 | 5 7 36.4 | 16.159 | 13 | 1 48 19.20 | 2.2248 | 7 40 1.6 | 15.145 |
| 14 | 0 2 35.64 | 2.2979 | 4 51 26.1 | 16.182 | 14 | 1 50 32.69 | 2.2247 | 7 55 8.5 | 15.083 |
| 15 | 0 4 53.38 | 2.2949 | 4 35 14.5 | 16.202 | 15 | 1 52 46.17 | 2.2247 | 8 10 11.6 | 15.019 |
| 16 | 0 7 10.94 | 2.2912 | 4 19 1.8 | 16.221 | 16 | 1 54 59.65 | 2.2247 | 8 25 10.3 | 14.954 |
| 17 | 0 9 28.32 | 2.2883 | 4 2 48.0 | 16.237 | 17 | 1 57 13.13 | 2.2247 | 8 40 6.1 | 14.888 |
| 18 | 0 11 45.53 | 2.2855 | 3 46 33.3 | 16.252 | 18 | 1 59 26.62 | 2.2248 | 8 54 57.4 | 14.821 |
| 19 | 0 14 2.58 | 2.2828 | 3 30 17.8 | 16.264 | 19 | 2 1 40.11 | 2.2249 | 9 9 44.6 | 14.759 |
| 20 | 0 16 19.47 | 2.2801 | 3 14 1.6 | 16.275 | 20 | 2 3 53.61 | 2.2252 | 9 24 27.6 | 14.691 |
| 21 | 0 18 36.20 | 2.2775 | 2 57 44.8 | 16.283 | 21 | 2 6 7.13 | 2.2255 | 9 39 6.3 | 14.620 |
| 22 | 0 20 52.77 | 2.2750 | 2 41 27.6 | 16.290 | 22 | 2 8 20.67 | 2.2258 | 9 53 40.7 | 14.537 |
| 23 | 0 23 9.20 | 2.2726 | 2 25 10.0 | 16.295 | 23 | 2 10 34.23 | 2.2262 | 10 8 10.7 | 14.462 |
| 24 | 0 25 25.48 | 2.2701 | S. 2 8 52.2 | 16.297 | 24 | 2 12 47.81 | 2.2266 | N. 10 22 36.1 | 14.386 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|----------------|---------------------|------------|------------------|---------------------|--------------|---------------------|
| FRIDAY 13. | | | | | SUNDAY 15. | | | | |
| 0 | 2 12 47.81 | 2.2266 | N.10 22' 36.1" | 14.386 | 0 | 4 0 45.24 | 2.2789 | N.20 4' 6.5" | 9.470 |
| 1 | 2 15 1.42 | 2.2270 | 10 36 57.0 | 14.309 | 1 | 4 3 2.11 | 2.2802 | 20 13 31.0 | 9.347 |
| 2 | 2 17 15.05 | 2.2274 | 10 51 13.2 | 14.231 | 2 | 4 5 18.96 | 2.2815 | 20 22 48.1 | 9.223 |
| 3 | 2 19 28.71 | 2.2279 | 11 5 24.7 | 14.152 | 3 | 4 7 35.89 | 2.2827 | 20 31 57.8 | 9.099 |
| 4 | 2 21 42.40 | 2.2285 | 11 19 31.4 | 14.071 | 4 | 4 9 52.89 | 2.2840 | 20 41 0.0 | 8.973 |
| 5 | 2 23 56.13 | 2.2292 | 11 33 33.2 | 13.987 | 5 | 4 12 9.97 | 2.2852 | 20 49 54.6 | 8.847 |
| 6 | 2 26 9.90 | 2.2298 | 11 47 29.9 | 13.903 | 6 | 4 14 27.12 | 2.2864 | 20 58 41.7 | 8.721 |
| 7 | 2 28 23.71 | 2.2305 | 12 1 21.6 | 13.819 | 7 | 4 16 44.34 | 2.2876 | 21 7 21.2 | 8.594 |
| 8 | 2 30 37.56 | 2.2313 | 12 15 8.2 | 13.733 | 8 | 4 19 1.63 | 2.2888 | 21 15 53.0 | 8.467 |
| 9 | 2 32 51.46 | 2.2321 | 12 28 49.6 | 13.647 | 9 | 4 21 19.00 | 2.2900 | 21 24 17.2 | 8.339 |
| 10 | 2 35 5.41 | 2.2329 | 12 42 25.8 | 13.559 | 10 | 4 23 36.43 | 2.2910 | 21 32 33.7 | 8.210 |
| 11 | 2 37 19.41 | 2.2337 | 12 55 56.7 | 13.470 | 11 | 4 25 53.92 | 2.2921 | 21 40 42.4 | 8.081 |
| 12 | 2 39 33.45 | 2.2345 | 13 9 22.2 | 13.379 | 12 | 4 28 11.48 | 2.2932 | 21 48 43.4 | 7.952 |
| 13 | 2 41 47.55 | 2.2355 | 13 22 42.2 | 13.287 | 13 | 4 30 29.10 | 2.2942 | 21 56 36.6 | 7.822 |
| 14 | 2 44 1.71 | 2.2364 | 13 35 56.7 | 13.194 | 14 | 4 32 46.78 | 2.2952 | 22 4 22.0 | 7.692 |
| 15 | 2 46 15.92 | 2.2373 | 13 49 5.5 | 13.100 | 15 | 4 35 4.53 | 2.2962 | 22 11 59.6 | 7.561 |
| 16 | 2 48 30.19 | 2.2383 | 14 2 8.7 | 13.006 | 16 | 4 37 22.33 | 2.2972 | 22 19 29.3 | 7.429 |
| 17 | 2 50 44.52 | 2.2394 | 14 15 6.2 | 12.909 | 17 | 4 39 40.19 | 2.2982 | 22 26 51.1 | 7.298 |
| 18 | 2 52 58.92 | 2.2405 | 14 27 57.8 | 12.819 | 18 | 4 41 58.11 | 2.2991 | 22 34 5.1 | 7.166 |
| 19 | 2 55 13.38 | 2.2416 | 14 40 43.6 | 12.714 | 19 | 4 44 16.08 | 2.2999 | 22 41 11.1 | 7.033 |
| 20 | 2 57 27.91 | 2.2427 | 14 53 23.5 | 12.615 | 20 | 4 46 34.09 | 2.3006 | 22 48 9.1 | 6.901 |
| 21 | 2 59 42.50 | 2.2438 | 15 5 57.4 | 12.515 | 21 | 4 48 52.15 | 2.3013 | 22 54 59.2 | 6.768 |
| 22 | 3 1 57.16 | 2.2449 | 15 18 25.3 | 12.413 | 22 | 4 51 10.25 | 2.3021 | 23 1 41.3 | 6.634 |
| 23 | 3 4 11.89 | 2.2462 | N.15 30 47.0 | 12.310 | 23 | 4 53 28.40 | 2.3028 | N.23 8 15.3 | 6.500 |
| SATURDAY 14. | | | | | MONDAY 16. | | | | |
| 0 | 3 6 26.70 | 2.2474 | N.15 43 2.5 | 12.207 | 0 | 4 55 46.59 | 2.3034 | N.23 14 41.3 | 6.366 |
| 1 | 3 8 41.58 | 2.2486 | 15 55 11.8 | 12.103 | 1 | 4 58 4.81 | 2.3040 | 23 20 59.2 | 6.232 |
| 2 | 3 10 56.53 | 2.2498 | 16 7 14.9 | 11.993 | 2 | 5 0 23.07 | 2.3046 | 23 27 9.1 | 6.097 |
| 3 | 3 13 11.55 | 2.2510 | 16 19 11.6 | 11.892 | 3 | 5 2 41.36 | 2.3051 | 23 33 10.9 | 5.962 |
| 4 | 3 15 26.65 | 2.2523 | 16 31 1.9 | 11.785 | 4 | 5 4 59.68 | 2.3056 | 23 39 4.6 | 5.827 |
| 5 | 3 17 41.83 | 2.2536 | 16 42 45.8 | 11.678 | 5 | 5 7 18.03 | 2.3060 | 23 44 50.2 | 5.692 |
| 6 | 3 19 57.08 | 2.2549 | 16 54 23.3 | 11.570 | 6 | 5 9 36.40 | 2.3063 | 23 50 27.6 | 5.556 |
| 7 | 3 22 12.41 | 2.2562 | 17 5 54.2 | 11.459 | 7 | 5 11 54.79 | 2.3067 | 23 55 56.9 | 5.420 |
| 8 | 3 24 27.83 | 2.2576 | 17 17 18.4 | 11.348 | 8 | 5 14 13.20 | 2.3070 | 24 1 18.0 | 5.284 |
| 9 | 3 26 43.32 | 2.2589 | 17 28 35.9 | 11.236 | 9 | 5 16 31.63 | 2.3072 | 24 6 31.0 | 5.148 |
| 10 | 3 28 58.89 | 2.2602 | 17 39 46.7 | 11.124 | 10 | 5 18 50.07 | 2.3074 | 24 11 35.8 | 5.011 |
| 11 | 3 31 14.54 | 2.2615 | 17 50 50.8 | 11.011 | 11 | 5 21 8.52 | 2.3075 | 24 16 32.3 | 4.874 |
| 12 | 3 33 30.27 | 2.2628 | 18 1 48.0 | 10.897 | 12 | 5 23 26.97 | 2.3076 | 24 21 20.7 | 4.738 |
| 13 | 3 35 46.08 | 2.2642 | 18 12 38.4 | 10.782 | 13 | 5 25 45.43 | 2.3077 | 24 26 0.9 | 4.601 |
| 14 | 3 38 1.97 | 2.2655 | 18 23 21.9 | 10.667 | 14 | 5 28 3.89 | 2.3078 | 24 30 32.9 | 4.464 |
| 15 | 3 40 17.94 | 2.2669 | 18 33 58.4 | 10.550 | 15 | 5 30 22.34 | 2.3075 | 24 34 56.6 | 4.327 |
| 16 | 3 42 34.00 | 2.2683 | 18 44 27.9 | 10.433 | 16 | 5 32 40.79 | 2.3073 | 24 39 12.1 | 4.191 |
| 17 | 3 44 50.14 | 2.2697 | 18 54 50.4 | 10.315 | 17 | 5 34 59.22 | 2.3071 | 24 43 19.5 | 4.054 |
| 18 | 3 47 6.36 | 2.2710 | 19 5 5.7 | 10.196 | 18 | 5 37 17.64 | 2.3068 | 24 47 18.6 | 3.917 |
| 19 | 3 49 22.66 | 2.2723 | 19 15 13.9 | 10.077 | 19 | 5 39 36.04 | 2.3065 | 24 51 9.5 | 3.779 |
| 20 | 3 51 39.04 | 2.2736 | 19 25 14.9 | 9.957 | 20 | 5 41 54.42 | 2.3062 | 24 54 52.1 | 3.642 |
| 21 | 3 53 55.49 | 2.2749 | 19 35 8.8 | 9.837 | 21 | 5 44 12.78 | 2.3057 | 24 58 26.5 | 3.505 |
| 22 | 3 56 12.03 | 2.2763 | 19 44 55.4 | 9.715 | 22 | 5 46 31.11 | 2.3052 | 25 1 52.7 | 3.368 |
| 23 | 3 58 28.65 | 2.2776 | 19 54 34.6 | 9.592 | 23 | 5 48 49.41 | 2.3047 | 25 5 10.7 | 3.231 |
| 24 | 4 0 45.34 | 2.2789 | N.20 4 6.5 | 9.470 | 24 | 5 51 7.68 | 2.3042 | N.25 8 20.4 | 3.094 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|------------------|---------------------|----------------|---------------------|--------------|------------------|---------------------|----------------|---------------------|
| TUESDAY 17. | | | | | THURSDAY 19. | | | | |
| 0 | 5 51 7.68 | 2.3042 | N.25° 8' 20.4" | 3.094 | 0 | 7 39 52.80 | 2.3054 | N.25° 2' 46.1" | 3.188 |
| 1 | 5 53 25.91 | 2.3035 | 25 11 21.9 | 2.957 | 1 | 7 42 5.03 | 2.3021 | 24 59 31.2 | 3.308 |
| 2 | 5 55 44.10 | 2.3027 | 25 14 15.2 | 2.820 | 2 | 7 44 17.06 | 2.1987 | 24 56 9.1 | 3.428 |
| 3 | 5 58 2.24 | 2.3019 | 25 17 0.3 | 2.682 | 3 | 7 46 28.88 | 2.1953 | 24 52 39.8 | 3.547 |
| 4 | 6 0 20.33 | 2.3011 | 25 19 37.1 | 2.545 | 4 | 7 48 40.50 | 2.1919 | 24 49 3.4 | 3.665 |
| 5 | 6 2 38.37 | 2.3002 | 25 22 5.7 | 2.408 | 5 | 7 50 51.91 | 2.1885 | 24 45 20.0 | 3.783 |
| 6 | 6 4 56.35 | 2.2992 | 25 24 26.1 | 2.272 | 6 | 7 53 3.12 | 2.1850 | 24 41 29.5 | 3.900 |
| 7 | 6 7 14.27 | 2.2982 | 25 26 38.3 | 2.135 | 7 | 7 55 14.11 | 2.1814 | 24 37 32.0 | 4.016 |
| 8 | 6 9 32.13 | 2.2971 | 25 28 42.3 | 1.999 | 8 | 7 57 24.89 | 2.1778 | 24 33 27.6 | 4.131 |
| 9 | 6 11 49.92 | 2.2959 | 25 30 38.2 | 1.863 | 9 | 7 59 35.45 | 2.1743 | 24 29 16.3 | 4.246 |
| 10 | 6 14 7.64 | 2.2946 | 25 32 25.9 | 1.727 | 10 | 8 1 45.80 | 2.1707 | 24 24 58.1 | 4.360 |
| 11 | 6 16 25.28 | 2.2933 | 25 34 5.5 | 1.592 | 11 | 8 3 55.93 | 2.1670 | 24 20 33.1 | 4.474 |
| 12 | 6 18 42.84 | 2.2920 | 25 35 36.9 | 1.456 | 12 | 8 6 5.84 | 2.1633 | 24 16 1.2 | 4.587 |
| 13 | 6 21 0.32 | 2.2906 | 25 37 0.2 | 1.321 | 13 | 8 8 15.53 | 2.1596 | 24 11 22.6 | 4.699 |
| 14 | 6 23 17.71 | 2.2891 | 25 38 15.4 | 1.185 | 14 | 8 10 24.99 | 2.1558 | 24 6 37.3 | 4.811 |
| 15 | 6 25 35.01 | 2.2876 | 25 39 22.4 | 1.050 | 15 | 8 12 34.23 | 2.1521 | 24 1 45.3 | 4.922 |
| 16 | 6 27 52.22 | 2.2861 | 25 40 21.4 | 0.916 | 16 | 8 14 43.24 | 2.1483 | 23 56 46.6 | 5.032 |
| 17 | 6 30 9.34 | 2.2845 | 25 41 12.3 | 0.782 | 17 | 8 16 52.02 | 2.1445 | 23 51 41.4 | 5.142 |
| 18 | 6 32 26.36 | 2.2827 | 25 41 55.2 | 0.647 | 18 | 8 19 0.58 | 2.1407 | 23 46 29.6 | 5.251 |
| 19 | 6 34 43.27 | 2.2809 | 25 42 30.0 | 0.513 | 19 | 8 21 8.91 | 2.1368 | 23 41 11.3 | 5.359 |
| 20 | 6 37 0.07 | 2.2791 | 25 42 56.8 | 0.380 | 20 | 8 23 17.00 | 2.1329 | 23 35 46.5 | 5.467 |
| 21 | 6 39 16.76 | 2.2772 | 25 43 15.6 | 0.247 | 21 | 8 25 24.86 | 2.1291 | 23 30 15.3 | 5.573 |
| 22 | 6 41 33.34 | 2.2753 | 25 43 26.4 | + 0.114 | 22 | 8 27 32.49 | 2.1252 | 23 24 37.7 | 5.679 |
| 23 | 6 43 49.80 | 2.2733 | N.25 43 29.3 | - 0.019 | 23 | 8 29 39.88 | 2.1213 | N.23 18 53.8 | 5.784 |
| WEDNESDAY 18. | | | | | FRIDAY 20. | | | | |
| 0 | 6 46 6.13 | 2.2712 | N.25 43 24.2 | 0.151 | 0 | 8 31 47.04 | 2.1173 | N.23 13 3.6 | 5.889 |
| 1 | 6 48 22.34 | 2.2691 | 25 43 11.2 | 0.282 | 1 | 8 33 53.96 | 2.1133 | 23 7 7.1 | 5.993 |
| 2 | 6 50 38.42 | 2.2668 | 25 42 50.3 | 0.413 | 2 | 8 36 0.64 | 2.1094 | 23 1 4.4 | 6.096 |
| 3 | 6 52 54.36 | 2.2646 | 25 42 21.6 | 0.544 | 3 | 8 38 7.09 | 2.1055 | 22 54 55.6 | 6.199 |
| 4 | 6 55 10.17 | 2.2623 | 25 41 45.0 | 0.675 | 4 | 8 40 13.30 | 2.1015 | 22 48 40.6 | 6.301 |
| 5 | 6 57 25.84 | 2.2600 | 25 41 0.6 | 0.806 | 5 | 8 42 19.27 | 2.0976 | 22 42 19.5 | 6.402 |
| 6 | 6 59 41.37 | 2.2576 | 25 40 8.3 | 0.936 | 6 | 8 44 25.01 | 2.0936 | 22 35 52.4 | 6.503 |
| 7 | 7 1 56.75 | 2.2551 | 25 39 8.3 | 1.065 | 7 | 8 46 30.51 | 2.0896 | 22 29 19.3 | 6.601 |
| 8 | 7 4 11.98 | 2.2526 | 25 38 0.5 | 1.194 | 8 | 8 48 35.76 | 2.0855 | 22 22 40.3 | 6.700 |
| 9 | 7 6 27.06 | 2.2500 | 25 36 45.0 | 1.322 | 9 | 8 50 40.77 | 2.0815 | 22 15 55.3 | 6.799 |
| 10 | 7 8 41.98 | 2.2473 | 25 35 21.8 | 1.450 | 10 | 8 52 45.54 | 2.0775 | 22 9 4.4 | 6.896 |
| 11 | 7 10 56.74 | 2.2446 | 25 33 51.0 | 1.577 | 11 | 8 54 50.07 | 2.0736 | 22 2 7.8 | 6.992 |
| 12 | 7 13 11.34 | 2.2419 | 25 32 12.5 | 1.705 | 12 | 8 56 54.37 | 2.0697 | 21 55 5.4 | 7.088 |
| 13 | 7 15 25.77 | 2.2391 | 25 30 26.4 | 1.832 | 13 | 8 58 58.43 | 2.0656 | 21 47 57.3 | 7.183 |
| 14 | 7 17 40.03 | 2.2362 | 25 28 32.7 | 1.958 | 14 | 9 1 2.24 | 2.0615 | 21 40 43.5 | 7.278 |
| 15 | 7 19 54.12 | 2.2334 | 25 26 31.5 | 2.083 | 15 | 9 3 5.81 | 2.0575 | 21 33 24.0 | 7.372 |
| 16 | 7 22 8.04 | 2.2306 | 25 24 22.8 | 2.208 | 16 | 9 5 9.14 | 2.0535 | 21 25 58.9 | 7.464 |
| 17 | 7 24 21.79 | 2.2277 | 25 22 6.6 | 2.333 | 17 | 9 7 12.23 | 2.0496 | 21 18 28.3 | 7.555 |
| 18 | 7 26 35.36 | 2.2246 | 25 19 42.9 | 2.457 | 18 | 9 9 15.09 | 2.0456 | 21 10 52.3 | 7.646 |
| 19 | 7 28 48.74 | 2.2214 | 25 17 11.8 | 2.580 | 19 | 9 11 17.70 | 2.0415 | 21 3 10.8 | 7.737 |
| 20 | 7 31 1.93 | 2.2183 | 25 14 33.3 | 2.703 | 20 | 9 13 20.07 | 2.0376 | 20 55 23.9 | 7.827 |
| 21 | 7 33 14.94 | 2.2152 | 25 11 47.4 | 2.826 | 21 | 9 15 22.21 | 2.0337 | 20 47 31.6 | 7.916 |
| 22 | 7 35 27.76 | 2.2120 | 25 8 54.2 | 2.947 | 22 | 9 17 24.11 | 2.0297 | 20 39 34.0 | 8.004 |
| 23 | 7 37 40.38 | 2.2087 | 25 5 53.8 | 3.068 | 23 | 9 19 25.77 | 2.0257 | 20 31 31.1 | 8.092 |
| 24 | 7 39 52.80 | 2.2054 | N.25 2 46.1 | 3.188 | 24 | 9 21 27.20 | 2.0218 | N.20 23 23.0 | 8.178 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|------------------------|-----------------|------------------------|-------------|------------------|------------------------|-----------------|------------------------|
| SATURDAY 21. | | | | | MONDAY 23. | | | | |
| 0 | 9 21 27.20 | 2.0818 | N. 20° 23' 23.0 | 8.178 | 0 | 10 54 23.87 | 1.8698 | N. 12° 25' 30.9 | 11.442 |
| 1 | 9 23 28.39 | 2.0179 | 20 15 9.7 | 8.964 | 1 | 10 56 15.57 | 1.8605 | 12 14 2.9 | 11.491 |
| 2 | 9 25 29.35 | 2.0140 | 20 6 51.3 | 8.349 | 2 | 10 58 7.13 | 1.8581 | 12 2 32.0 | 11.540 |
| 3 | 9 27 30.07 | 2.0101 | 19 58 27.8 | 8.433 | 3 | 10 59 58.54 | 1.8558 | 11 50 58.1 | 11.589 |
| 4 | 9 29 30.56 | 2.0062 | 19 49 59.3 | 8.517 | 4 | 11 1 49.82 | 1.8535 | 11 39 21.3 | 11.638 |
| 5 | 9 31 30.82 | 2.0023 | 19 41 25.8 | 8.600 | 5 | 11 3 40.96 | 1.8513 | 11 27 41.8 | 11.688 |
| 6 | 9 33 30.84 | 1.9984 | 19 32 47.3 | 8.682 | 6 | 11 5 31.97 | 1.8491 | 11 15 59.5 | 11.738 |
| 7 | 9 35 30.63 | 1.9946 | 19 24 3.9 | 8.763 | 7 | 11 7 22.85 | 1.8469 | 11 4 14.5 | 11.773 |
| 8 | 9 37 30.20 | 1.9909 | 19 15 15.7 | 8.843 | 8 | 11 9 13.60 | 1.8448 | 10 52 26.8 | 11.818 |
| 9 | 9 39 29.54 | 1.9871 | 19 6 22.7 | 8.923 | 9 | 11 11 4.23 | 1.8427 | 10 40 36.4 | 11.869 |
| 10 | 9 41 28.65 | 1.9834 | 18 57 24.9 | 9.002 | 10 | 11 12 54.73 | 1.8407 | 10 28 43.4 | 11.904 |
| 11 | 9 43 27.54 | 1.9797 | 18 48 22.4 | 9.081 | 11 | 11 14 45.12 | 1.8388 | 10 16 47.9 | 11.946 |
| 12 | 9 45 26.21 | 1.9766 | 18 39 15.2 | 9.158 | 12 | 11 16 35.39 | 1.8369 | 10 4 49.9 | 11.987 |
| 13 | 9 47 24.66 | 1.9728 | 18 30 3.4 | 9.235 | 13 | 11 18 25.55 | 1.8351 | 9 52 49.4 | 12.028 |
| 14 | 9 49 22.88 | 1.9685 | 18 20 47.0 | 9.311 | 14 | 11 20 15.60 | 1.8332 | 9 40 46.5 | 12.068 |
| 15 | 9 51 20.88 | 1.9648 | 18 11 26.1 | 9.386 | 15 | 11 22 5.54 | 1.8314 | 9 28 41.3 | 12.107 |
| 16 | 9 53 18.66 | 1.9613 | 18 2 0.7 | 9.460 | 16 | 11 23 55.37 | 1.8298 | 9 16 33.7 | 12.146 |
| 17 | 9 55 16.23 | 1.9577 | 17 52 30.9 | 9.534 | 17 | 11 25 45.11 | 1.8282 | 9 4 23.8 | 12.184 |
| 18 | 9 57 13.58 | 1.9541 | 17 42 56.6 | 9.607 | 18 | 11 27 34.75 | 1.8265 | 8 52 11.6 | 12.222 |
| 19 | 9 59 10.72 | 1.9506 | 17 33 18.0 | 9.679 | 19 | 11 29 24.29 | 1.8249 | 8 39 57.2 | 12.258 |
| 20 | 10 1 7.65 | 1.9471 | 17 23 35.1 | 9.751 | 20 | 11 31 13.74 | 1.8234 | 8 27 40.7 | 12.293 |
| 21 | 10 3 4.37 | 1.9436 | 17 13 47.9 | 9.822 | 21 | 11 33 3.10 | 1.8220 | 8 15 22.1 | 12.328 |
| 22 | 10 5 0.88 | 1.9401 | 17 3 56.5 | 9.891 | 22 | 11 34 52.38 | 1.8206 | 8 3 1.4 | 12.362 |
| 23 | 10 6 57.18 | 1.9367 | N. 16 54 1.0 | 9.960 | 23 | 11 36 41.57 | 1.8192 | N. 7 50 38.7 | 12.395 |
| SUNDAY 22. | | | | | TUESDAY 24. | | | | |
| 0 | 10 8 53.28 | 1.9333 | N. 16 44 1.3 | 10.029 | 0 | 11 38 30.68 | 1.8179 | N. 7 38 14.0 | 12.427 |
| 1 | 10 10 49.18 | 1.9300 | 16 33 57.5 | 10.096 | 1 | 11 40 19.72 | 1.8166 | 7 25 47.4 | 12.459 |
| 2 | 10 12 44.88 | 1.9267 | 16 23 49.7 | 10.162 | 2 | 11 42 8.68 | 1.8154 | 7 13 18.9 | 12.491 |
| 3 | 10 14 40.38 | 1.9234 | 16 13 38.0 | 10.228 | 3 | 11 43 57.57 | 1.8143 | 7 0 48.5 | 12.522 |
| 4 | 10 16 35.68 | 1.9201 | 16 3 22.3 | 10.294 | 4 | 11 45 46.40 | 1.8132 | 6 48 16.3 | 12.551 |
| 5 | 10 18 30.79 | 1.9168 | 15 53 2.7 | 10.358 | 5 | 11 47 35.16 | 1.8122 | 6 35 42.4 | 12.580 |
| 6 | 10 20 25.70 | 1.9137 | 15 42 39.3 | 10.422 | 6 | 11 49 23.86 | 1.8112 | 6 23 6.7 | 12.608 |
| 7 | 10 22 20.43 | 1.9106 | 15 32 12.1 | 10.485 | 7 | 11 51 12.50 | 1.8103 | 6 10 29.4 | 12.635 |
| 8 | 10 24 14.97 | 1.9074 | 15 21 41.1 | 10.547 | 8 | 11 53 1.109 | 1.8094 | 5 57 50.5 | 12.662 |
| 9 | 10 26 9.32 | 1.9043 | 15 11 6.4 | 10.609 | 9 | 11 54 49.63 | 1.8086 | 5 45 9.9 | 12.689 |
| 10 | 10 28 3.49 | 1.9013 | 15 0 28.0 | 10.670 | 10 | 11 56 38.12 | 1.8078 | 5 32 27.8 | 12.714 |
| 11 | 10 29 57.48 | 1.8988 | 14 49 46.0 | 10.730 | 11 | 11 58 26.57 | 1.8071 | 5 19 44.2 | 12.738 |
| 12 | 10 31 51.28 | 1.8959 | 14 39 0.4 | 10.789 | 12 | 12 0 14.98 | 1.8065 | 5 6 59.2 | 12.762 |
| 13 | 10 33 44.90 | 1.8924 | 14 28 11.3 | 10.847 | 13 | 12 2 3.35 | 1.8059 | 4 54 12.8 | 12.785 |
| 14 | 10 35 38.36 | 1.8896 | 14 17 18.7 | 10.905 | 14 | 12 3 51.69 | 1.8053 | 4 41 25.0 | 12.807 |
| 15 | 10 37 31.65 | 1.8867 | 14 6 22.7 | 10.962 | 15 | 12 5 39.99 | 1.8047 | 4 28 35.9 | 12.829 |
| 16 | 10 39 24.77 | 1.8839 | 13 55 23.3 | 11.018 | 16 | 12 7 28.26 | 1.8043 | 4 15 45.5 | 12.850 |
| 17 | 10 41 17.72 | 1.8811 | 13 44 20.5 | 11.074 | 17 | 12 9 16.51 | 1.8040 | 4 2 53.9 | 12.870 |
| 18 | 10 43 10.50 | 1.8784 | 13 33 14.4 | 11.128 | 18 | 12 11 4.74 | 1.8037 | 3 50 1.1 | 12.889 |
| 19 | 10 45 3.12 | 1.8757 | 13 22 5.1 | 11.182 | 19 | 12 12 52.95 | 1.8034 | 3 37 7.2 | 12.908 |
| 20 | 10 46 55.58 | 1.8730 | 13 10 52.5 | 11.236 | 20 | 12 14 41.15 | 1.8032 | 3 24 12.2 | 12.926 |
| 21 | 10 48 47.88 | 1.8704 | 12 59 36.7 | 11.289 | 21 | 12 16 29.33 | 1.8030 | 3 11 16.1 | 12.943 |
| 22 | 10 50 40.03 | 1.8679 | 12 48 17.8 | 11.340 | 22 | 12 18 17.51 | 1.8030 | 2 58 19.0 | 12.959 |
| 23 | 10 52 32.03 | 1.8653 | 12 36 55.9 | 11.391 | 23 | 12 20 5.69 | 1.8029 | 2 45 21.0 | 12.975 |
| 24 | 10 54 23.87 | 1.8628 | N. 12 25 30.9 | 11.442 | 24 | 12 21 53.86 | 1.8029 | N. 2 32 22.0 | 12.991 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|------------------|---------------------|--------------|---------------------|--------------|------------------|---------------------|---------------|---------------------|
| WEDNESDAY 25. | | | | | FRIDAY 27. | | | | |
| 0 | 12 21 53.86 | 1.8029 | N. 2 32 22.0 | 13.991 | 0 | 13 49 33.76 | 1.8797 | S. 7 53 37.7 | 12.783 |
| 1 | 12 23 42.04 | 1.8030 | 2 19 22.1 | 13.005 | 1 | 13 51 26.21 | 1.8756 | 8 6 23.9 | 12.758 |
| 2 | 12 25 30.22 | 1.8031 | 2 6 21.4 | 13.018 | 2 | 13 53 18.83 | 1.8785 | 8 19 8.7 | 12.733 |
| 3 | 12 27 18.41 | 1.8033 | 1 53 20.0 | 13.030 | 3 | 13 55 11.63 | 1.8816 | 8 31 51.9 | 12.707 |
| 4 | 12 29 6.61 | 1.8035 | 1 40 17.8 | 13.042 | 4 | 13 57 4.62 | 1.8847 | 8 44 33.5 | 12.679 |
| 5 | 12 30 54.83 | 1.8038 | 1 27 14.9 | 13.053 | 5 | 13 58 57.80 | 1.8878 | 8 57 13.4 | 12.651 |
| 6 | 12 32 43.07 | 1.8042 | 1 14 11.4 | 13.063 | 6 | 14 0 51.16 | 1.8910 | 9 9 51.6 | 12.622 |
| 7 | 12 34 31.33 | 1.8046 | 1 1 7.3 | 13.073 | 7 | 14 2 44.72 | 1.8943 | 9 22 28.0 | 12.592 |
| 8 | 12 36 19.62 | 1.8051 | 0 48 2.6 | 13.082 | 8 | 14 4 38.48 | 1.8977 | 9 35 2.6 | 12.560 |
| 9 | 12 38 7.94 | 1.8056 | 0 34 57.4 | 13.090 | 9 | 14 6 32.44 | 1.9010 | 9 47 35.2 | 12.528 |
| 10 | 12 39 56.29 | 1.8062 | 0 21 51.8 | 13.098 | 10 | 14 8 26.60 | 1.9044 | 10 0 5.9 | 12.495 |
| 11 | 12 41 44.68 | 1.8068 | N. 0 8 45.7 | 13.105 | 11 | 14 10 20.97 | 1.9080 | 10 12 34.6 | 12.461 |
| 12 | 12 43 33.11 | 1.8075 | S. 0 4 20.8 | 13.111 | 12 | 14 12 15.56 | 1.9116 | 10 25 1.2 | 12.426 |
| 13 | 12 45 21.58 | 1.8083 | 0 17 27.6 | 13.115 | 13 | 14 14 10.36 | 1.9152 | 10 37 25.7 | 12.390 |
| 14 | 12 47 10.10 | 1.8092 | 0 30 34.6 | 13.119 | 14 | 14 16 5.38 | 1.9188 | 10 49 48.0 | 12.353 |
| 15 | 12 48 58.68 | 1.8101 | 0 43 41.9 | 13.123 | 15 | 14 18 0.62 | 1.9226 | 11 2 8.1 | 12.316 |
| 16 | 12 50 47.31 | 1.8110 | 0 56 49.4 | 13.126 | 16 | 14 19 56.09 | 1.9264 | 11 14 25.9 | 12.277 |
| 17 | 12 52 36.00 | 1.8120 | 1 9 57.0 | 13.128 | 17 | 14 21 51.79 | 1.9303 | 11 26 41.4 | 12.238 |
| 18 | 12 54 24.75 | 1.8130 | 1 23 4.7 | 13.129 | 18 | 14 23 47.72 | 1.9341 | 11 38 54.5 | 12.197 |
| 19 | 12 56 13.56 | 1.8141 | 1 36 12.5 | 13.129 | 19 | 14 25 43.88 | 1.9380 | 11 51 5.1 | 12.156 |
| 20 | 12 58 2.44 | 1.8153 | 1 49 20.2 | 13.128 | 20 | 14 27 40.28 | 1.9421 | 12 3 13.2 | 12.113 |
| 21 | 12 59 51.40 | 1.8166 | 2 2 27.9 | 13.127 | 21 | 14 29 36.93 | 1.9462 | 12 15 18.7 | 12.069 |
| 22 | 13 1 40.43 | 1.8179 | 2 15 35.5 | 13.125 | 22 | 14 31 33.83 | 1.9504 | 12 27 21.5 | 12.025 |
| 23 | 13 3 29.54 | 1.8193 | S. 2 28 42.9 | 13.121 | 23 | 14 33 30.98 | 1.9546 | S. 12 39 21.7 | 11.980 |
| THURSDAY 26. | | | | | SATURDAY 28. | | | | |
| 0 | 13 5 18.74 | 1.8208 | S. 2 41 50.1 | 13.117 | 0 | 14 35 28.38 | 1.9588 | S. 12 51 19.1 | 11.933 |
| 1 | 13 7 8.03 | 1.8222 | 2 54 57.0 | 13.113 | 1 | 14 37 26.04 | 1.9631 | 13 3 13.7 | 11.886 |
| 2 | 13 8 57.40 | 1.8236 | 3 8 3.7 | 13.109 | 2 | 14 39 23.96 | 1.9674 | 13 15 5.4 | 11.837 |
| 3 | 13 10 46.86 | 1.8252 | 3 21 10.1 | 13.103 | 3 | 14 41 22.13 | 1.9717 | 13 26 54.1 | 11.787 |
| 4 | 13 12 36.42 | 1.8269 | 3 34 16.1 | 13.096 | 4 | 14 43 20.57 | 1.9760 | 13 38 39.8 | 11.737 |
| 5 | 13 14 26.09 | 1.8287 | 3 47 21.6 | 13.089 | 5 | 14 45 19.28 | 1.9807 | 13 50 22.5 | 11.686 |
| 6 | 13 16 15.86 | 1.8304 | 4 0 26.7 | 13.081 | 6 | 14 47 18.26 | 1.9853 | 14 2 2.1 | 11.633 |
| 7 | 13 18 5.74 | 1.8322 | 4 13 31.3 | 13.071 | 7 | 14 49 17.52 | 1.9900 | 14 13 38.5 | 11.579 |
| 8 | 13 19 55.73 | 1.8342 | 4 26 35.2 | 13.060 | 8 | 14 51 17.06 | 1.9947 | 14 25 11.6 | 11.524 |
| 9 | 13 21 45.84 | 1.8362 | 4 39 38.5 | 13.049 | 9 | 14 53 16.88 | 1.9993 | 14 36 41.4 | 11.468 |
| 10 | 13 23 36.07 | 1.8382 | 4 52 41.1 | 13.037 | 10 | 14 55 16.98 | 2.0040 | 14 48 7.8 | 11.412 |
| 11 | 13 25 26.42 | 1.8402 | 5 5 43.0 | 13.025 | 11 | 14 57 17.36 | 2.0088 | 14 59 30.8 | 11.354 |
| 12 | 13 27 16.89 | 1.8423 | 5 18 44.1 | 13.011 | 12 | 14 59 18.03 | 2.0137 | 15 10 50.3 | 11.295 |
| 13 | 13 29 7.49 | 1.8445 | 5 31 44.3 | 12.997 | 13 | 15 1 19.00 | 2.0187 | 15 22 6.2 | 11.235 |
| 14 | 13 30 58.23 | 1.8468 | 5 44 43.7 | 12.982 | 14 | 15 3 20.27 | 2.0236 | 15 33 18.5 | 11.174 |
| 15 | 13 32 49.11 | 1.8492 | 5 57 42.2 | 12.967 | 15 | 15 5 21.83 | 2.0285 | 15 44 27.1 | 11.112 |
| 16 | 13 34 40.13 | 1.8515 | 6 10 39.7 | 12.949 | 16 | 15 7 23.69 | 2.0336 | 15 55 31.9 | 11.048 |
| 17 | 13 36 31.29 | 1.8539 | 6 23 36.1 | 12.931 | 17 | 15 9 25.86 | 2.0387 | 16 6 32.9 | 10.983 |
| 18 | 13 38 22.60 | 1.8564 | 6 36 31.4 | 12.912 | 18 | 15 11 28.34 | 2.0439 | 16 17 29.9 | 10.918 |
| 19 | 13 40 14.06 | 1.8590 | 6 49 25.6 | 12.893 | 19 | 15 13 31.13 | 2.0491 | 16 28 23.0 | 10.852 |
| 20 | 13 42 5.68 | 1.8616 | 7 2 18.6 | 12.873 | 20 | 15 15 34.23 | 2.0543 | 16 39 12.1 | 10.784 |
| 21 | 13 43 57.45 | 1.8642 | 7 15 10.4 | 12.852 | 21 | 15 17 37.64 | 2.0595 | 16 49 57.1 | 10.716 |
| 22 | 13 45 49.38 | 1.8669 | 7 28 0.9 | 12.830 | 22 | 15 19 41.37 | 2.0648 | 17 0 38.0 | 10.646 |
| 23 | 13 47 41.48 | 1.8698 | 7 40 50.0 | 12.807 | 23 | 15 21 45.42 | 2.0701 | 17 11 14.6 | 10.574 |
| 24 | 13 49 33.76 | 1.8727 | S. 7 53 37.7 | 12.783 | 24 | 15 23 49.78 | 2.0754 | S. 17 21 46.9 | 10.500 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|------------|------------------|---------------------|------------------|---------------------|---|------------------|---------------------|------------------|---------------------|
| SUNDAY 29. | | | | | TUESDAY 31. | | | | |
| 0 | 15 23 49.78 | 2.0754 | S. 17° 21' 46.9" | 10.509 | 0 | 17 10 5.96 | 2.3543 | S. 24° 0' 26.6" | 5.650 |
| 1 | 15 25 54.47 | 2.0809 | 17 32 14.9 | 10.429 | 1 | 17 12 27.38 | 2.3598 | 24 6 1.7 | 5.530 |
| 2 | 15 27 59.49 | 2.0864 | 17 42 38.4 | 10.354 | 2 | 17 14 49.14 | 2.3654 | 24 11 29.0 | 5.389 |
| 3 | 15 30 4.84 | 2.0919 | 17 52 57.4 | 10.279 | 3 | 17 17 11.23 | 2.3708 | 24 16 48.4 | 5.257 |
| 4 | 15 32 10.52 | 2.0974 | 18 3 11.9 | 10.202 | 4 | 17 19 33.64 | 2.3762 | 24 21 59.8 | 5.123 |
| 5 | 15 34 16.53 | 2.1029 | 18 13 21.7 | 10.123 | 5 | 17 21 56.38 | 2.3816 | 24 27 3.2 | 4.988 |
| 6 | 15 36 22.87 | 2.1085 | 18 23 26.7 | 10.044 | 6 | 17 24 19.44 | 2.3870 | 24 31 58.4 | 4.852 |
| 7 | 15 38 29.55 | 2.1142 | 18 33 27.0 | 9.965 | 7 | 17 26 42.82 | 2.3923 | 24 36 45.5 | 4.716 |
| 8 | 15 40 36.57 | 2.1198 | 18 43 22.5 | 9.883 | 8 | 17 29 6.51 | 2.3975 | 24 41 24.3 | 4.578 |
| 9 | 15 42 43.93 | 2.1255 | 18 53 13.0 | 9.800 | 9 | 17 31 30.52 | 2.4027 | 24 45 54.8 | 4.439 |
| 10 | 15 44 51.63 | 2.1312 | 19 2 58.5 | 9.717 | 10 | 17 33 54.84 | 2.4078 | 24 50 17.0 | 4.300 |
| 11 | 15 46 59.68 | 2.1370 | 19 12 39.0 | 9.632 | 11 | 17 36 19.46 | 2.4128 | 24 54 30.8 | 4.159 |
| 12 | 15 49 8.07 | 2.1428 | 19 22 14.4 | 9.547 | 12 | 17 38 44.38 | 2.4178 | 24 58 36.1 | 4.017 |
| 13 | 15 51 16.81 | 2.1486 | 19 31 44.7 | 9.460 | 13 | 17 41 9.60 | 2.4227 | 25 2 32.8 | 3.874 |
| 14 | 15 53 25.90 | 2.1543 | 19 41 9.6 | 9.370 | 14 | 17 43 35.11 | 2.4276 | 25 6 20.9 | 3.730 |
| 15 | 15 55 35.33 | 2.1601 | 19 50 29.1 | 9.280 | 15 | 17 46 0.91 | 2.4324 | 25 10 0.4 | 3.585 |
| 16 | 15 57 45.11 | 2.1660 | 19 59 43.2 | 9.190 | 16 | 17 48 27.00 | 2.4371 | 25 13 31.1 | 3.439 |
| 17 | 15 59 55.25 | 2.1719 | 20 8 51.9 | 9.098 | 17 | 17 50 53.36 | 2.4417 | 25 16 53.0 | 3.292 |
| 18 | 16 2 5.74 | 2.1778 | 20 17 55.0 | 9.005 | 18 | 17 53 20.00 | 2.4462 | 25 20 6.1 | 3.144 |
| 19 | 16 4 16.58 | 2.1837 | 20 26 52.5 | 8.911 | 19 | 17 55 46.91 | 2.4507 | 25 23 10.3 | 2.995 |
| 20 | 16 6 27.78 | 2.1897 | 20 35 44.3 | 8.815 | 20 | 17 58 14.09 | 2.4552 | 25 26 5.5 | 2.845 |
| 21 | 16 8 39.34 | 2.1956 | 20 44 30.3 | 8.718 | 21 | 18 0 41.53 | 2.4595 | 25 28 51.7 | 2.694 |
| 22 | 16 10 51.25 | 2.2015 | 20 53 10.5 | 8.620 | 22 | 18 3 9.23 | 2.4637 | 25 31 28.8 | 2.543 |
| 23 | 16 13 3.52 | 2.2074 | S. 21° 1' 44.7" | 8.520 | 23 | 18 5 37.17 | 2.4678 | S. 25° 33' 56.9" | 2.392 |
| MONDAY 30. | | | | | WEDNESDAY, APRIL 1. | | | | |
| 0 | 16 15 16.14 | 2.2133 | S. 21° 10' 12.9" | 8.419 | 0 | 18 8 5.36 | 2.4718 | S. 25° 36' 15.8" | 2.236 |
| 1 | 16 17 29.12 | 2.2194 | 21 18 35.0 | 8.318 | PHASES OF THE MOON. | | | | |
| 2 | 16 19 42.47 | 2.2254 | 21 26 51.1 | 8.217 | | | | | |
| 3 | 16 21 56.17 | 2.2313 | 21 35 1.0 | 8.113 | | | | | |
| 4 | 16 24 10.23 | 2.2373 | 21 43 4.6 | 8.007 | | | | | |
| 5 | 16 26 24.65 | 2.2432 | 21 51 1.8 | 7.900 | ☾ Last Quarter . . Mar. 3 ^d 7 ^h 37.5 ^m | | | | |
| 6 | 16 28 39.42 | 2.2492 | 21 58 52.6 | 7.792 | | | | | |
| 7 | 16 30 54.55 | 2.2552 | 22 6 36.9 | 7.684 | | | | | |
| 8 | 16 33 10.05 | 2.2612 | 22 14 14.7 | 7.574 | | | | | |
| 9 | 16 35 25.90 | 2.2672 | 22 21 45.8 | 7.463 | ● New Moon 9 23 50.7 | | | | |
| 10 | 16 37 42.11 | 2.2731 | 22 29 10.2 | 7.350 | | | | | |
| 11 | 16 39 58.67 | 2.2790 | 22 36 27.8 | 7.236 | | | | | |
| 12 | 16 42 15.59 | 2.2850 | 22 43 38.5 | 7.121 | | | | | |
| 13 | 16 44 32.87 | 2.2909 | 22 50 42.3 | 7.005 | ☽ First Quarter 16 21 10.5 | | | | |
| 14 | 16 46 50.50 | 2.2967 | 22 57 39.1 | 6.888 | | | | | |
| 15 | 16 49 8.48 | 2.3026 | 23 4 28.9 | 6.770 | | | | | |
| 16 | 16 51 26.81 | 2.3084 | 23 11 11.5 | 6.650 | | | | | |
| 17 | 16 53 45.49 | 2.3143 | 23 17 46.9 | 6.529 | ☾ Perigee Mar. 9 12.7 | | | | |
| 18 | 16 56 4.53 | 2.3202 | 23 24 15.0 | 6.407 | | | | | |
| 19 | 16 58 23.91 | 2.3259 | 23 30 35.7 | 6.283 | | | | | |
| 20 | 17 0 43.64 | 2.3316 | 23 36 49.0 | 6.159 | | | | | |
| 21 | 17 3 3.71 | 2.3373 | 23 42 54.8 | 6.034 | ☾ Apogee 22 9.7 | | | | |
| 22 | 17 5 24.12 | 2.3430 | 23 48 53.1 | 5.907 | | | | | |
| 23 | 17 7 44.87 | 2.3487 | 23 54 43.7 | 5.779 | | | | | |
| 24 | 17 10 5.96 | 2.3543 | S. 24° 0' 26.6" | 5.650 | | | | | |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|----|------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
| 1 | Regulus | W. | 75° 9' 10" | 2867 | 76° 42' 11" | 2855 | 78° 15' 27" | 2844 | 79° 48' 58" | 2832 |
| | SATURN | W. | 59 23 0 | 2832 | 60 56 46 | 2821 | 62 30 46 | 2809 | 64 5 2 | 2798 |
| | Spica | W. | 21 34 30 | 3007 | 23 4 34 | 2979 | 24 35 13 | 2953 | 26 6 25 | 2928 |
| | VENUS | E. | 71 3 38 | 3276 | 69 38 58 | 3265 | 68 14 5 | 3253 | 66 48 58 | 3241 |
| | α Aquilæ | E. | 77 22 22 | 3676 | 76 5 9 | 3676 | 74 47 56 | 3677 | 73 30 45 | 3679 |
| | SUN | E. | 117 8 52 | 3240 | 115 43 30 | 3227 | 114 17 53 | 3215 | 112 52 2 | 3202 |
| 2 | Regulus | W. | 87 40 28 | 2769 | 89 15 36 | 2756 | 90 51 2 | 2742 | 92 26 46 | 2728 |
| | SATURN | W. | 72 0 18 | 2735 | 73 36 12 | 2721 | 75 12 24 | 2707 | 76 48 54 | 2693 |
| | Spica | W. | 33 49 38 | 2885 | 35 23 34 | 2865 | 36 57 55 | 2847 | 38 32 40 | 2829 |
| | VENUS | E. | 59 39 44 | 3176 | 58 13 6 | 3163 | 56 46 12 | 3148 | 55 19 1 | 3134 |
| | α Aquilæ | E. | 67 5 52 | 3710 | 65 49 16 | 3722 | 64 32 52 | 3734 | 63 16 41 | 3746 |
| | SUN | E. | 105 38 42 | 3132 | 104 11 11 | 3117 | 102 43 22 | 3101 | 101 15 14 | 3087 |
| 3 | SATURN | W. | 84 56 15 | 2619 | 86 34 44 | 2603 | 88 13 35 | 2588 | 89 52 47 | 2572 |
| | Spica | W. | 46 32 16 | 2681 | 48 9 22 | 2663 | 49 46 52 | 2645 | 51 24 46 | 2628 |
| | VENUS | E. | 47 58 43 | 3060 | 46 29 45 | 3046 | 45 0 29 | 3030 | 43 30 54 | 3015 |
| | α Aquilæ | E. | 57 0 32 | 3865 | 55 46 37 | 3898 | 54 33 15 | 3936 | 53 20 32 | 3978 |
| | SUN | E. | 93 49 45 | 3004 | 92 19 37 | 2988 | 90 49 9 | 2970 | 89 18 19 | 2953 |
| 4 | Spica | W. | 59 40 18 | 2538 | 61 20 39 | 2520 | 63 1 25 | 2502 | 64 42 36 | 2483 |
| | VENUS | E. | 35 58 20 | 2942 | 34 26 54 | 2928 | 32 55 11 | 2916 | 31 23 12 | 2905 |
| | SUN | E. | 81 38 33 | 2862 | 80 5 26 | 2845 | 78 31 56 | 2826 | 76 58 2 | 2807 |
| 5 | Spica | W. | 73 14 57 | 2393 | 74 58 42 | 2375 | 76 42 53 | 2357 | 78 27 29 | 2339 |
| | Antares | W. | 27 26 27 | 2433 | 29 9 15 | 2410 | 30 52 36 | 2387 | 32 36 30 | 2365 |
| | SUN | E. | 69 2 24 | 2714 | 67 26 3 | 2695 | 65 49 17 | 2678 | 64 12 7 | 2659 |
| 6 | Spica | W. | 87 16 52 | 2254 | 89 3 59 | 2237 | 90 51 31 | 2221 | 92 39 27 | 2206 |
| | Antares | W. | 41 23 39 | 2264 | 43 10 32 | 2245 | 44 57 52 | 2227 | 46 45 39 | 2210 |
| | SUN | E. | 56 0 11 | 2572 | 54 20 37 | 2555 | 52 40 40 | 2538 | 51 0 20 | 2523 |
| 7 | Spica | W. | 101 44 48 | 2133 | 103 34 57 | 2120 | 105 25 25 | 2107 | 107 16 13 | 2096 |
| | Antares | W. | 55 50 47 | 2131 | 57 40 59 | 2116 | 59 31 33 | 2103 | 61 22 27 | 2090 |
| | SUN | E. | 42 33 30 | 2453 | 40 51 11 | 2441 | 39 8 35 | 2430 | 37 25 43 | 2421 |
| 8 | Antares | W. | 70 41 43 | 2034 | 72 34 24 | 2025 | 74 27 19 | 2017 | 76 20 27 | 2009 |
| | SUN | E. | 28 48 32 | 2391 | 27 4 45 | 2392 | 25 20 59 | 2396 | 23 37 18 | 2403 |
| 11 | SUN | W. | 15 0 16 | 2553 | 16 40 15 | 2512 | 18 21 11 | 2469 | 20 2 40 | 2477 |
| | Aldebaran | E. | 63 1 14 | 2044 | 61 8 49 | 2055 | 59 16 40 | 2066 | 57 24 49 | 2079 |
| | Pollux | E. | 107 6 26 | 2096 | 105 13 33 | 2037 | 103 20 56 | 2047 | 101 28 35 | 2057 |
| 12 | SUN | W. | 28 31 33 | 2489 | 30 13 2 | 2497 | 31 54 20 | 2507 | 33 35 24 | 2519 |
| | Aldebaran | E. | 48 10 30 | 2151 | 46 20 58 | 2168 | 44 31 42 | 2186 | 42 42 53 | 2204 |
| | Pollux | E. | 92 11 20 | 2122 | 90 20 54 | 2137 | 88 30 51 | 2151 | 86 41 10 | 2167 |
| 13 | SUN | W. | 41 56 3 | 2593 | 43 35 7 | 2610 | 45 13 48 | 2628 | 46 52 5 | 2646 |
| | Aldebaran | E. | 33 46 9 | 2311 | 32 0 25 | 2335 | 30 15 17 | 2362 | 28 30 48 | 2391 |
| | Pollux | E. | 77 38 50 | 2251 | 75 51 38 | 2269 | 74 4 53 | 2287 | 72 18 35 | 2305 |
| 14 | SUN | W. | 54 57 19 | 2741 | 56 33 5 | 2760 | 58 8 25 | 2780 | 59 43 19 | 2801 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|----|-------------|----------------|-------------|----------------|------------|----------------|------------|----------------|
| 1 | Regulus | W. | 81° 22' 44" | 2890 | 82° 56' 46" | 2808 | 84° 31' 3" | 2785 | 86° 5' 37" | 2782 |
| | SATURN | W. | 65 39 33 | 2785 | 67 14 20 | 2773 | 68 49 23 | 2761 | 70 24 42 | 2748 |
| | Spica | W. | 27 38 8 | 2905 | 29 10 20 | 2883 | 30 43 0 | 2863 | 32 16 6 | 2843 |
| | VENUS | E. | 65 23 37 | 3228 | 63 58 1 | 3216 | 62 32 11 | 3203 | 61 6 5 | 3190 |
| | α Aquilæ | E. | 72 13 36 | 3683 | 70 56 31 | 3688 | 69 39 31 | 3693 | 68 22 37 | 3709 |
| | SUN | E. | 111 25 55 | 3188 | 109 59 31 | 3175 | 108 32 52 | 3161 | 107 5 56 | 3146 |
| 2 | Regulus | W. | 94 2 49 | 2713 | 95 39 11 | 2689 | 97 15 52 | 2684 | 98 52 53 | 2669 |
| | SATURN | W. | 78 25 43 | 2679 | 80 2 51 | 2684 | 81 40 19 | 2649 | 83 18 7 | 2635 |
| | Spica | W. | 40 7 48 | 2751 | 41 43 20 | 2734 | 43 19 15 | 2716 | 44 55 34 | 2698 |
| | VENUS | E. | 53 51 33 | 3119 | 52 23 47 | 3105 | 50 55 44 | 3091 | 49 27 23 | 3075 |
| | α Aquilæ | E. | 62 0 45 | 3767 | 60 45 8 | 3786 | 59 29 51 | 3809 | 58 14 58 | 3835 |
| | SUN | E. | 99 46 48 | 3070 | 98 18 2 | 3054 | 96 48 56 | 3039 | 95 19 31 | 3022 |
| 3 | SATURN | W. | 91 32 21 | 2555 | 93 12 18 | 2539 | 94 52 37 | 2522 | 96 33 19 | 2505 |
| | Spica | W. | 53 3 3 | 2610 | 54 41 45 | 2592 | 56 20 51 | 2574 | 58 0 22 | 2556 |
| | VENUS | E. | 42 1 0 | 3001 | 40 30 48 | 2985 | 39 0 17 | 2971 | 37 29 28 | 2956 |
| | α Aquilæ | E. | 52 8 31 | 4098 | 50 57 19 | 4082 | 49 47 0 | 4144 | 48 37 41 | 4214 |
| | SUN | E. | 87 47 7 | 2935 | 86 15 33 | 2917 | 84 43 36 | 2899 | 83 11 16 | 2881 |
| 4 | Spica | W. | 66 24 13 | 2465 | 68 6 16 | 2447 | 69 48 44 | 2429 | 71 31 38 | 2411 |
| | VENUS | E. | 29 50 59 | 2894 | 28 18 32 | 2884 | 26 45 53 | 2876 | 25 13 3 | 2867 |
| | SUN | E. | 75 23 43 | 2788 | 73 49 0 | 2770 | 72 13 53 | 2751 | 70 38 21 | 2732 |
| 5 | Spica | W. | 80 12 31 | 2322 | 81 57 58 | 2304 | 83 43 51 | 2287 | 85 30 9 | 2270 |
| | Antares | W. | 34 20 55 | 2344 | 36 5 51 | 2332 | 37 51 18 | 2302 | 39 37 14 | 2283 |
| | SUN | E. | 62 34 32 | 2641 | 60 56 33 | 2624 | 59 18 10 | 2605 | 57 39 22 | 2588 |
| 6 | Spica | W. | 94 27 46 | 2190 | 96 16 28 | 2175 | 98 5 33 | 2161 | 99 55 0 | 2147 |
| | Antares | W. | 48 33 51 | 2193 | 50 22 29 | 2177 | 52 11 31 | 2161 | 54 0 57 | 2145 |
| | SUN | E. | 49 19 39 | 2508 | 47 38 37 | 2493 | 45 57 14 | 2479 | 44 15 31 | 2466 |
| 7 | Spica | W. | 109 7 19 | 2085 | 110 58 42 | 2073 | 112 50 22 | 2064 | 114 42 17 | 2055 |
| | Antares | W. | 63 13 42 | 2077 | 65 5 16 | 2066 | 66 57 8 | 2055 | 68 49 17 | 2044 |
| | SUN | E. | 35 42 38 | 2412 | 33 59 20 | 2405 | 32 15 52 | 2398 | 30 32 15 | 2394 |
| 8 | Antares | W. | 78 13 47 | 2003 | 80 7 17 | 1996 | 82 0 57 | 1991 | 83 54 45 | 1986 |
| | SUN | E. | 21 53 47 | 2415 | 20 10 34 | 2432 | 18 27 45 | 2455 | 16 45 29 | 2487 |
| 11 | SUN | W. | 21 44 26 | 2473 | 23 26 17 | 2473 | 25 8 8 | 2477 | 26 49 54 | 2482 |
| | Aldebaran | E. | 55 33 17 | 2092 | 53 42 5 | 2105 | 51 51 14 | 2120 | 50 0 45 | 2135 |
| | Pollux | E. | 99 36 30 | 2060 | 97 44 43 | 2081 | 95 53 15 | 2094 | 94 2 7 | 2108 |
| 12 | SUN | W. | 35 16 11 | 2532 | 36 56 40 | 2546 | 38 36 49 | 2561 | 40 16 37 | 2577 |
| | Aldebaran | E. | 40 54 32 | 2224 | 39 6 40 | 2244 | 37 19 18 | 2265 | 35 32 27 | 2287 |
| | Pollux | E. | 84 51 53 | 2183 | 83 3 0 | 2199 | 81 14 31 | 2216 | 79 26 28 | 2233 |
| 13 | SUN | W. | 48 29 58 | 2663 | 50 7 27 | 2683 | 51 44 30 | 2702 | 53 21 7 | 2721 |
| | Aldebaran | E. | 26 47 0 | 2422 | 25 3 56 | 2455 | 23 21 39 | 2491 | 21 40 13 | 2532 |
| | Pollux | E. | 70 32 43 | 2324 | 68 47 18 | 2343 | 67 2 21 | 2362 | 65 17 51 | 2381 |
| 14 | SUN | W. | 61 17 47 | 2820 | 62 51 49 | 2840 | 64 25 25 | 2859 | 65 58 36 | 2880 |

| GREENWICH MEAN TIME. | | | | | | | | | | |
|----------------------|-------------------------------|-----|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
| LUNAR DISTANCES. | | | | | | | | | | |
| Day of the Month. | Name and Direction of Object. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
| 14 | MARS | W. | 14 21 56 | 2716 | 15 58 15 | 2720 | 17 34 28 | 2728 | 19 10 31 | 2738 |
| | Pollux | E. | 63 33 49 | 2400 | 61 50 14 | 2419 | 60 7 7 | 2439 | 58 24 28 | 2458 |
| | Regulus | E. | 99 44 44 | 2405 | 98 1 16 | 2424 | 96 18 16 | 2443 | 94 35 43 | 2462 |
| 15 | SUN | W. | 67 31 21 | 2899 | 69 3 41 | 2920 | 70 35 35 | 2938 | 72 7 5 | 2958 |
| | α Arietis | W. | 27 57 15 | 3046 | 29 26 31 | 3018 | 30 56 22 | 2995 | 32 26 41 | 2977 |
| | MARS | W. | 27 6 43 | 2811 | 28 40 57 | 2828 | 30 14 49 | 2845 | 31 48 19 | 2862 |
| | Pollux | E. | 49 58 2 | 2556 | 48 18 6 | 2574 | 46 38 36 | 2593 | 44 59 32 | 2613 |
| | Regulus | E. | 86 9 39 | 2557 | 84 29 45 | 2576 | 82 50 17 | 2594 | 81 11 14 | 2613 |
| 16 | SUN | W. | 79 38 33 | 3052 | 81 7 41 | 3071 | 82 36 26 | 3088 | 84 4 50 | 3106 |
| | α Arietis | W. | 40 2 7 | 2945 | 41 33 29 | 2946 | 43 4 49 | 2949 | 44 36 6 | 2953 |
| | Pollux | E. | 36 50 41 | 2707 | 35 14 11 | 2725 | 33 38 5 | 2744 | 32 2 24 | 2763 |
| | Regulus | E. | 73 2 12 | 2702 | 71 25 35 | 2719 | 69 49 21 | 2736 | 68 13 29 | 2753 |
| | 17 | SUN | W. | 91 21 38 | 3188 | 92 48 1 | 3204 | 94 14 5 | 3220 | 95 39 51 |
| α Arietis | | W. | 52 10 56 | 2984 | 53 41 29 | 2991 | 55 11 53 | 2999 | 56 42 7 | 3006 |
| Regulus | | E. | 60 19 34 | 2832 | 58 45 48 | 2847 | 57 12 21 | 2861 | 55 39 12 | 2876 |
| 18 | SUN | W. | 102 44 34 | 3300 | 104 8 45 | 3313 | 105 32 41 | 3325 | 106 56 24 | 3336 |
| | α Arietis | W. | 64 10 49 | 3047 | 65 40 3 | 3055 | 67 9 8 | 3063 | 68 38 3 | 3071 |
| | Aldebaran | W. | 33 6 12 | 2981 | 34 36 49 | 2987 | 36 7 18 | 2993 | 37 37 39 | 3001 |
| | Regulus | E. | 47 57 55 | 2942 | 46 26 30 | 2954 | 44 55 20 | 2967 | 43 24 26 | 2978 |
| | Spica | E. | 102 1 10 | 2939 | 100 29 41 | 2950 | 98 58 26 | 2961 | 97 27 24 | 2970 |
| 19 | SUN | W. | 113 51 52 | 3386 | 115 14 24 | 3395 | 116 36 46 | 3403 | 117 58 59 | 3412 |
| | α Arietis | W. | 76 0 20 | 3106 | 77 28 22 | 3113 | 78 56 16 | 3119 | 80 24 3 | 3125 |
| | Aldebaran | W. | 45 7 19 | 3039 | 46 36 52 | 3039 | 48 6 17 | 3044 | 49 35 35 | 3049 |
| | Regulus | E. | 35 53 30 | 3035 | 34 24 1 | 3046 | 32 54 45 | 3057 | 31 25 43 | 3068 |
| | SATURN | E. | 50 3 2 | 2977 | 48 32 20 | 2985 | 47 1 48 | 2993 | 45 31 26 | 3000 |
| | Spica | E. | 89 55 13 | 3016 | 88 25 20 | 3023 | 86 55 36 | 3030 | 85 26 1 | 3038 |
| 20 | SUN | W. | 124 47 54 | 3446 | 126 9 19 | 3452 | 127 30 37 | 3457 | 128 51 49 | 3462 |
| | α Arietis | W. | 87 41 12 | 3152 | 89 8 19 | 3156 | 90 35 21 | 3161 | 92 2 17 | 3164 |
| | Aldebaran | W. | 57 0 32 | 3073 | 58 29 15 | 3077 | 59 57 53 | 3081 | 61 26 26 | 3083 |
| | SATURN | E. | 38 1 47 | 3033 | 36 32 15 | 3039 | 35 2 50 | 3044 | 33 33 32 | 3050 |
| | Spica | E. | 78 0 9 | 3068 | 76 31 20 | 3073 | 75 2 37 | 3077 | 73 33 59 | 3082 |
| 21 | Aldebaran | W. | 68 48 23 | 3085 | 70 16 39 | 3096 | 71 44 53 | 3098 | 73 13 5 | 3099 |
| | Pollux | W. | 24 39 9 | 3110 | 26 7 7 | 3108 | 27 35 7 | 3106 | 29 3 9 | 3105 |
| | SATURN | E. | 26 8 38 | 3075 | 24 39 58 | 3080 | 23 11 24 | 3086 | 21 42 57 | 3093 |
| | Spica | E. | 66 12 2 | 3098 | 64 43 50 | 3101 | 63 15 41 | 3103 | 61 47 35 | 3105 |
| 22 | Aldebaran | W. | 80 33 55 | 3100 | 82 2 5 | 3099 | 83 30 16 | 3098 | 84 58 28 | 3097 |
| | Pollux | W. | 36 23 45 | 3098 | 37 51 57 | 3096 | 39 20 12 | 3095 | 40 48 28 | 3092 |
| | Spica | E. | 54 27 36 | 3111 | 52 59 40 | 3113 | 51 31 46 | 3114 | 50 3 53 | 3114 |
| | Antares | E. | 100 18 28 | 3093 | 98 50 10 | 3092 | 97 21 51 | 3092 | 95 53 32 | 3091 |
| 23 | Aldebaran | W. | 92 19 51 | 3089 | 93 48 14 | 3087 | 95 16 40 | 3085 | 96 45 8 | 3082 |
| | Pollux | W. | 48 10 30 | 3081 | 49 39 3 | 3078 | 51 7 40 | 3074 | 52 36 21 | 3072 |
| | Spica | E. | 42 44 34 | 3116 | 41 16 44 | 3116 | 39 48 54 | 3117 | 38 21 5 | 3119 |
| | Antares | E. | 88 31 29 | 3089 | 87 2 58 | 3080 | 85 34 24 | 3078 | 84 5 47 | 3075 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XV ^h . | P. L. of Diff. | XVIII ^h . | P. L. of Diff. | XXI ^h . | P. L. of Diff. |
|-------------------|-------------------------------|----|-------------|----------------|-------------------|----------------|----------------------|----------------|--------------------|----------------|
| 14 | MARS | W. | 20° 46' 21" | 9750 | 22° 21' 55" | 9763 | 23° 57' 11" | 9779 | 25° 32' 7" | 9794 |
| | Pollux | E. | 56 42 16 | 9478 | 55 0 32 | 9497 | 53 19 15 | 9517 | 51 38 25 | 9536 |
| | Regulus | E. | 92 53 37 | 9462 | 91 11 58 | 9500 | 89 30 45 | 9520 | 87 49 59 | 9538 |
| 15 | SUN | W. | 73 38 11 | 9977 | 75 8 52 | 9997 | 76 39 9 | 3016 | 78 9 2 | 3034 |
| | α Arietis | W. | 33 57 22 | 9965 | 35 28 19 | 9954 | 36 59 29 | 9949 | 38 30 46 | 9946 |
| | MARS | W. | 33 21 26 | 9880 | 34 54 11 | 9896 | 36 26 35 | 9914 | 37 58 36 | 9931 |
| | Pollux | E. | 43 20 55 | 9639 | 41 42 43 | 9651 | 40 4 57 | 9669 | 38 27 36 | 9689 |
| | Regulus | E. | 79 32 37 | 9631 | 77 54 24 | 9649 | 76 16 36 | 9667 | 74 39 12 | 9685 |
| 16 | SUN | W. | 85 32 52 | 3194 | 87 0 33 | 3139 | 88 27 55 | 3157 | 89 54 56 | 3173 |
| | α Arietis | W. | 46 7 18 | 9958 | 47 38 24 | 9963 | 49 9 23 | 9969 | 50 40 14 | 9977 |
| | Pollux | E. | 30 27 7 | 9781 | 28 52 14 | 9800 | 27 17 46 | 9818 | 25 43 42 | 9837 |
| | Regulus | E. | 66 38 0 | 9769 | 65 2 52 | 9786 | 63 28 6 | 9801 | 61 53 40 | 9817 |
| 17 | SUN | W. | 97 5 20 | 3247 | 98 30 33 | 3262 | 99 55 29 | 3276 | 101 20 9 | 3288 |
| | α Arietis | W. | 58 12 12 | 3014 | 59 42 7 | 3023 | 61 11 51 | 3031 | 62 41 25 | 3039 |
| | Regulus | E. | 54 6 22 | 9890 | 52 33 50 | 9903 | 51 1 35 | 9916 | 49 29 37 | 9929 |
| 18 | SUN | W. | 108 19 54 | 3347 | 109 43 11 | 3358 | 111 6 16 | 3368 | 112 29 9 | 3377 |
| | α Arietis | W. | 70 6 48 | 3078 | 71 35 24 | 3086 | 73 3 51 | 3092 | 74 32 10 | 3100 |
| | Aldebaran | W. | 39 7 51 | 3007 | 40 37 55 | 3014 | 42 7 51 | 3020 | 43 37 39 | 3026 |
| | Regulus | E. | 41 53 46 | 9990 | 40 23 21 | 3001 | 38 53 10 | 3013 | 37 23 13 | 3024 |
| | Spica | E. | 95 56 34 | 9981 | 94 25 57 | 9989 | 92 55 31 | 9999 | 91 25 17 | 3007 |
| 19 | SUN | W. | 119 21 2 | 3419 | 120 42 57 | 3427 | 122 4 43 | 3433 | 123 26 22 | 3439 |
| | α Arietis | W. | 81 51 42 | 3131 | 83 19 14 | 3136 | 84 46 40 | 3142 | 86 13 59 | 3147 |
| | Aldebaran | W. | 51 4 47 | 3055 | 52 33 52 | 3060 | 54 2 51 | 3065 | 55 31 44 | 3069 |
| | Regulus | E. | 29 56 54 | 3080 | 28 28 20 | 3091 | 27 0 0 | 3105 | 25 31 56 | 3118 |
| | SATURN | E. | 44 1 13 | 3007 | 42 31 9 | 3014 | 41 1 14 | 3021 | 39 31 27 | 3026 |
| | Spica | E. | 83 56 35 | 3044 | 82 27 17 | 3051 | 80 58 7 | 3057 | 79 29 5 | 3062 |
| 20 | SUN | W. | 130 12 56 | 3467 | 131 33 57 | 3471 | 132 54 53 | 3475 | 134 15 45 | 3479 |
| | α Arietis | W. | 93 29 9 | 3168 | 94 55 56 | 3172 | 96 22 39 | 3178 | 97 49 17 | 3178 |
| | Aldebaran | W. | 62 54 56 | 3087 | 64 23 22 | 3089 | 65 51 45 | 3091 | 67 20 5 | 3093 |
| | SATURN | E. | 32 4 21 | 3055 | 30 35 16 | 3060 | 29 6 17 | 3065 | 27 37 24 | 3070 |
| | Spica | E. | 72 5 27 | 3085 | 70 36 59 | 3089 | 69 8 36 | 3092 | 67 40 17 | 3096 |
| 21 | Aldebaran | W. | 74 41 16 | 3100 | 76 9 26 | 3100 | 77 37 36 | 3101 | 79 5 45 | 3100 |
| | Pollux | W. | 30 31 13 | 3103 | 31 59 19 | 3102 | 33 27 26 | 3101 | 34 55 35 | 3100 |
| | SATURN | E. | 20 14 39 | 3101 | 18 46 30 | 3109 | 17 18 31 | 3119 | 15 50 45 | 3132 |
| | Spica | E. | 60 19 32 | 3107 | 58 51 31 | 3108 | 57 23 31 | 3110 | 55 55 33 | 3110 |
| 22 | Aldebaran | W. | 86 26 41 | 3096 | 87 54 56 | 3095 | 89 23 12 | 3093 | 90 51 30 | 3091 |
| | Pollux | W. | 42 16 47 | 3090 | 43 45 9 | 3088 | 45 13 33 | 3086 | 46 42 0 | 3083 |
| | Spica | E. | 48 36 0 | 3114 | 47 8 8 | 3114 | 45 40 16 | 3115 | 44 12 25 | 3115 |
| | Antares | E. | 94 25 11 | 3089 | 92 56 48 | 3088 | 91 28 24 | 3087 | 89 59 58 | 3084 |
| 23 | Aldebaran | W. | 98 13 40 | 3079 | 99 42 15 | 3077 | 101 10 53 | 3073 | 102 39 35 | 3069 |
| | Pollux | W. | 54 5 5 | 3069 | 55 33 53 | 3065 | 57 2 46 | 3061 | 58 31 43 | 3058 |
| | Spica | E. | 36 53 18 | 3119 | 35 25 32 | 3120 | 33 57 47 | 3123 | 32 30 5 | 3125 |
| | Antares | E. | 82 37 7 | 3072 | 81 8 23 | 3069 | 79 39 36 | 3066 | 78 10 45 | 3063 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | III ^h . | P. L. of Diff. | VI ^h . | P. L. of Diff. | IX ^h . | P. L. of Diff. |
|-------------------|-------------------------------|------------|----------------|--------------------|----------------|-------------------|----------------|-------------------|----------------|
| 24 | Pollux W. | 60° 0' 44" | 3054 | 61° 29' 50" | 3050 | 62° 59' 1" | 3046 | 64° 28' 17" | 3043 |
| | Regulus W. | 24 5 45 | 3122 | 25 33 28 | 3111 | 27 1 24 | 3101 | 28 29 33 | 3091 |
| | Spica E. | 31 2 26 | 3122 | 29 34 51 | 3133 | 28 7 21 | 3138 | 26 39 58 | 3145 |
| | Antares E. | 76 41 50 | 3060 | 75 12 51 | 3056 | 73 43 47 | 3052 | 72 14 39 | 3048 |
| 25 | Pollux W. | 71 55 59 | 3018 | 73 25 49 | 3013 | 74 55 46 | 3008 | 76 25 49 | 3003 |
| | Regulus W. | 35 53 3 | 3050 | 37 22 14 | 3042 | 38 51 35 | 3034 | 40 21 5 | 3028 |
| | SATURN W. | 21 54 29 | 3032 | 23 24 15 | 3014 | 24 54 11 | 3005 | 26 24 18 | 2997 |
| | Antares E. | 64 47 44 | 3027 | 63 18 5 | 3023 | 61 48 21 | 3018 | 60 18 31 | 3014 |
| 26 | Pollux W. | 83 57 43 | 2975 | 85 28 27 | 2969 | 86 59 18 | 2963 | 88 30 17 | 2957 |
| | Regulus W. | 47 50 44 | 2993 | 49 21 6 | 2985 | 50 51 37 | 2979 | 52 22 16 | 2972 |
| | SATURN W. | 33 57 14 | 2960 | 35 28 17 | 2954 | 36 59 28 | 2946 | 38 30 48 | 2939 |
| | Antares E. | 52 47 53 | 2989 | 51 17 27 | 2985 | 49 46 55 | 2980 | 48 16 17 | 2974 |
| | α Aquilæ E. | 100 19 10 | 3775 | 99 3 42 | 3762 | 97 48 0 | 3750 | 96 32 6 | 3740 |
| 27 | Pollux W. | 96 7 12 | 2924 | 97 39 0 | 2918 | 99 10 56 | 2911 | 100 43 1 | 2904 |
| | Regulus W. | 59 57 45 | 2936 | 61 29 18 | 2928 | 63 1 1 | 2921 | 64 32 53 | 2914 |
| | SATURN W. | 46 9 42 | 2905 | 47 41 55 | 2897 | 49 14 18 | 2890 | 50 46 50 | 2882 |
| | Antares E. | 40 41 31 | 2950 | 39 10 15 | 2946 | 37 38 54 | 2941 | 36 7 27 | 2936 |
| | α Aquilæ E. | 90 10 3 | 3698 | 88 53 14 | 3692 | 87 36 18 | 3687 | 86 19 17 | 3682 |
| | VENUS E. | 115 29 37 | 3369 | 114 6 45 | 3361 | 112 43 44 | 3353 | 111 20 34 | 3345 |
| 28 | Regulus W. | 72 14 37 | 2875 | 73 47 28 | 2866 | 75 20 30 | 2858 | 76 53 43 | 2850 |
| | SATURN W. | 58 31 57 | 2843 | 60 5 29 | 2835 | 61 39 11 | 2827 | 63 13 4 | 2819 |
| | Spica W. | 18 44 14 | 3053 | 20 13 21 | 3030 | 21 43 9 | 2991 | 23 13 33 | 2965 |
| | α Aquilæ E. | 79 53 22 | 3675 | 78 36 8 | 3675 | 77 18 54 | 3677 | 76 1 43 | 3680 |
| | VENUS E. | 104 22 17 | 3302 | 102 58 8 | 3293 | 101 33 48 | 3284 | 100 9 18 | 3275 |
| | Fomalhaut E. | 111 4 43 | 3057 | 109 35 41 | 3046 | 108 6 25 | 3034 | 106 36 55 | 3022 |
| 29 | Regulus W. | 84 42 32 | 2806 | 86 16 52 | 2796 | 87 51 25 | 2787 | 89 26 10 | 2777 |
| | SATURN W. | 71 5 13 | 2775 | 72 40 14 | 2766 | 74 15 27 | 2758 | 75 50 52 | 2747 |
| | Spica W. | 30 52 41 | 2868 | 32 25 41 | 2853 | 33 59 0 | 2838 | 35 32 38 | 2824 |
| | α Aquilæ E. | 69 37 6 | 3717 | 68 20 37 | 3737 | 67 4 19 | 3741 | 65 48 15 | 3756 |
| | VENUS E. | 93 4 1 | 3226 | 91 38 23 | 3216 | 90 12 33 | 3205 | 88 46 30 | 3195 |
| | Fomalhaut E. | 99 5 54 | 2969 | 97 35 2 | 2958 | 96 3 56 | 2947 | 94 32 37 | 2937 |
| | SUN E. | 135 28 17 | 3172 | 134 1 34 | 3161 | 132 34 38 | 3150 | 131 7 29 | 3138 |
| 30 | Regulus W. | 97 23 7 | 2737 | 98 59 11 | 2717 | 100 35 28 | 2707 | 102 11 59 | 2695 |
| | SATURN W. | 83 51 11 | 2697 | 85 27 55 | 2686 | 87 4 54 | 2675 | 88 42 7 | 2665 |
| | Spica W. | 43 25 22 | 2756 | 45 0 47 | 2744 | 46 36 29 | 2731 | 48 12 28 | 2718 |
| | α Aquilæ E. | 59 32 39 | 3666 | 58 18 45 | 3698 | 57 5 23 | 3691 | 55 52 35 | 3699 |
| | VENUS E. | 81 33 6 | 3140 | 80 5 45 | 3129 | 78 38 10 | 3117 | 77 10 21 | 3105 |
| | Fomalhaut E. | 86 52 47 | 2987 | 85 20 11 | 2976 | 83 47 22 | 2967 | 82 14 21 | 2957 |
| | SUN E. | 123 48 10 | 3079 | 122 19 35 | 3066 | 120 50 44 | 3055 | 119 21 39 | 3043 |
| 31 | SATURN W. | 96 51 55 | 2608 | 98 30 39 | 2596 | 100 9 40 | 2584 | 101 48 57 | 2572 |
| | Spica W. | 56 16 41 | 2653 | 57 54 24 | 2640 | 59 32 24 | 2626 | 61 10 43 | 2614 |
| | α Aquilæ E. | 49 59 31 | 4235 | 48 51 38 | 4309 | 47 44 54 | 4390 | 46 39 24 | 4481 |
| | VENUS E. | 69 47 35 | 3043 | 68 18 15 | 3030 | 66 48 40 | 3018 | 65 18 49 | 3005 |
| | Fomalhaut E. | 74 26 11 | 2911 | 72 51 57 | 2902 | 71 17 32 | 2794 | 69 42 56 | 2786 |
| | SUN E. | 111 52 18 | 2977 | 110 21 37 | 2965 | 108 50 40 | 2951 | 107 19 26 | 2937 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|----|-------------|----------------|------------|----------------|-------------|----------------|-------------|----------------|
| 24 | Pollux | W. | 65° 57' 38" | 3037 | 67° 27' 5" | 3033 | 68° 56' 37" | 3028 | 70° 26' 15" | 3023 |
| | Regulus | W. | 29 57 53 | 3082 | 31 26 25 | 3073 | 32 55 8 | 3065 | 34 24 1 | 3057 |
| | Spica | E. | 25 12 43 | 3154 | 23 45 39 | 3165 | 22 18 48 | 3179 | 20 52 14 | 3198 |
| | Antares | E. | 70 45 26 | 3044 | 69 16 8 | 3040 | 67 46 45 | 3036 | 66 17 17 | 3032 |
| 25 | Pollux | W. | 77 55 58 | 2997 | 79 26 14 | 2992 | 80 56 37 | 2986 | 82 27 7 | 2981 |
| | Regulus | W. | 41 50 43 | 3021 | 43 20 30 | 3014 | 44 50 26 | 3007 | 46 20 31 | 3000 |
| | SATURN | W. | 27 54 34 | 2989 | 29 25 0 | 2981 | 30 55 36 | 2975 | 32 26 20 | 2967 |
| | Antares | E. | 58 48 35 | 3009 | 57 18 33 | 3005 | 55 48 26 | 3000 | 54 18 13 | 2994 |
| 26 | Pollux | W. | 90 1 24 | 2950 | 91 32 39 | 2944 | 93 4 2 | 2938 | 94 35 33 | 2931 |
| | Regulus | W. | 53 53 4 | 2965 | 55 24 0 | 2958 | 56 55 6 | 2950 | 58 26 21 | 2943 |
| | SATURN | W. | 40 2 17 | 2932 | 41 33 55 | 2925 | 43 5 42 | 2918 | 44 37 38 | 2912 |
| | Antares | E. | 46 45 32 | 2969 | 45 14 41 | 2965 | 43 43 44 | 2960 | 42 12 41 | 2954 |
| | α Aquilæ | E. | 95 16 1 | 3729 | 93 59 45 | 3721 | 92 43 20 | 3713 | 91 26 46 | 3704 |
| 27 | Pollux | W. | 102 15 15 | 2897 | 103 47 38 | 2890 | 105 20 10 | 2882 | 106 52 52 | 2874 |
| | Regulus | W. | 66 4 54 | 2906 | 67 37 5 | 2898 | 69 9 26 | 2891 | 70 41 56 | 2883 |
| | SATURN | W. | 52 19 32 | 2874 | 53 52 24 | 2867 | 55 25 25 | 2859 | 56 58 36 | 2852 |
| | Antares | E. | 34 35 54 | 2932 | 33 4 16 | 2928 | 31 32 33 | 2925 | 30 0 46 | 2922 |
| | α Aquilæ | E. | 85 2 11 | 3679 | 83 45 2 | 3677 | 82 27 50 | 3675 | 81 10 36 | 3675 |
| | VENUS | E. | 109 57 14 | 3336 | 108 33 44 | 3328 | 107 10 5 | 3319 | 105 46 16 | 3311 |
| 28 | Regulus | W. | 78 27 6 | 2842 | 80 0 40 | 2839 | 81 34 26 | 2834 | 83 8 23 | 2815 |
| | SATURN | W. | 64 47 7 | 2811 | 66 21 21 | 2801 | 67 55 47 | 2793 | 69 30 24 | 2784 |
| | Spica | W. | 24 44 29 | 2942 | 26 15 54 | 2921 | 27 47 46 | 2902 | 29 20 2 | 2884 |
| | α Aquilæ | E. | 74 44 35 | 3685 | 73 27 32 | 3691 | 72 10 35 | 3698 | 70 53 46 | 3707 |
| | VENUS | E. | 98 44 37 | 3265 | 97 19 45 | 3256 | 95 54 42 | 3246 | 94 29 27 | 3236 |
| | Fomalhaut | E. | 105 7 10 | 3011 | 103 37 11 | 3001 | 102 6 59 | 2999 | 100 36 33 | 2979 |
| 29 | Regulus | W. | 91 1 8 | 2768 | 92 36 18 | 2758 | 94 11 41 | 2748 | 95 47 17 | 2738 |
| | SATURN | W. | 77 26 29 | 2738 | 79 2 19 | 2727 | 80 38 23 | 2717 | 82 14 40 | 2707 |
| | Spica | W. | 37 6 35 | 2810 | 38 40 50 | 2796 | 40 15 23 | 2782 | 41 50 14 | 2769 |
| | α Aquilæ | E. | 64 32 27 | 3773 | 63 16 57 | 3792 | 62 1 47 | 3815 | 60 47 0 | 3840 |
| | VENUS | E. | 87 20 15 | 3184 | 85 53 47 | 3174 | 84 27 7 | 3163 | 83 0 13 | 3152 |
| | Fomalhaut | E. | 93 1 5 | 2927 | 91 29 20 | 2916 | 89 57 22 | 2906 | 88 25 11 | 2896 |
| | SUN | E. | 129 40 5 | 3198 | 128 12 27 | 3115 | 126 44 36 | 3103 | 125 16 30 | 3091 |
| 30 | Regulus | W. | 103 48 45 | 2685 | 105 25 45 | 2673 | 107 3 1 | 2663 | 108 40 31 | 2651 |
| | SATURN | W. | 90 19 34 | 2654 | 91 57 16 | 2642 | 93 35 14 | 2631 | 95 13 27 | 2620 |
| | Spica | W. | 49 48 44 | 2705 | 51 25 17 | 2692 | 53 2 8 | 2679 | 54 39 16 | 2666 |
| | α Aquilæ | E. | 54 40 25 | 4012 | 53 28 57 | 4059 | 52 18 15 | 4112 | 51 8 25 | 4171 |
| | VENUS | E. | 75 42 18 | 3093 | 74 14 0 | 3081 | 72 45 27 | 3069 | 71 16 30 | 30 6 |
| | Fomalhaut | E. | 80 41 7 | 2848 | 79 7 41 | 2838 | 77 34 3 | 2829 | 76 0 13 | 2820 |
| | SUN | E. | 117 52 19 | 3030 | 116 22 43 | 3017 | 114 52 51 | 3004 | 113 22 43 | 2990 |
| 31 | SATURN | W. | 103 28 31 | 2559 | 105 8 22 | 2547 | 106 48 30 | 2535 | 108 28 55 | 2522 |
| | Spica | W. | 62 49 19 | 2601 | 64 28 13 | 2587 | 66 7 26 | 2574 | 67 46 57 | 2560 |
| | α Aquilæ | E. | 45 35 15 | 4589 | 44 32 35 | 4697 | 43 31 33 | 4806 | 42 32 18 | 4970 |
| | VENUS | E. | 63 48 42 | 2991 | 62 18 18 | 2978 | 60 47 38 | 2965 | 59 16 41 | 2950 |
| | Fomalhaut | E. | 68 8 10 | 2778 | 66 33 13 | 2771 | 64 58 7 | 2763 | 63 22 51 | 2756 |
| | SUN | E. | 105 47 54 | 2923 | 104 16 4 | 2909 | 102 43 57 | 2895 | 101 11 32 | 2881 |

AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | | Sidereal Time of Semi-diameter Passing Meridian. | Equation of Time, to be Added to | Diff. for 1 Hour. |
|------------------|-------------------|---|-------------------|-----------------------|-------------------|----------------|--------------------------------|--|----------------------------------|-------------------|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | Semi-diameter. | Subtracted from Apparent Time. | | | |
| | | | | | | | | | | |
| Wed. | 1 | ^h 0 ^m 42 ^s 13.28 | 9.100 | N. 4° 32' 38.8" | +57.85 | 16' 2.19" | 64.51 | ^m 3 ^s 58.76 | 0.755 | |
| Thur. | 2 | 0 45 51.73 | 9.105 | 4 55 44.7 | 57.64 | 16 1.91 | 64.53 | 3 40.71 | 0.750 | |
| Frid. | 3 | 0 49 30.33 | 9.111 | 5 18 45.5 | 57.42 | 16 1 62 | 64.55 | 3 22.80 | 0.744 | |
| Sat. | 4 | 0 53 9.09 | 9.118 | 5 41 40.8 | +57.18 | 16 1.34 | 64.57 | 3 5 04 | 0.737 | |
| SUN. | 5 | 0 56 48.02 | 9.126 | 6 4 30.2 | 56.93 | 16 1.06 | 64.59 | 2 47.47 | 0.729 | |
| Mon. | 6 | 1 0 27.16 | 9.135 | 6 27 13.5 | 56.66 | 16 0.78 | 64.62 | 2 30.10 | 0.721 | |
| Tues. | 7 | 1 4 6.50 | 9.143 | 6 49 50.2 | +56.37 | 16 0.50 | 64.65 | 2 12.94 | 0.712 | |
| Wed. | 8 | 1 7 46.07 | 9.153 | 7 12 20.0 | 56.09 | 16 0.23 | 64.69 | 1 56.00 | 0.703 | |
| Thur. | 9 | 1 11 25.88 | 9.163 | 7 34 42.6 | 55.78 | 15 59.95 | 64.72 | 1 39.30 | 0.692 | |
| Frid. | 10 | 1 15 5.94 | 9.174 | 7 56 57.5 | +55.46 | 15 59.68 | 64.76 | 1 22.85 | 0.681 | |
| Sat. | 11 | 1 18 46.26 | 9.186 | 8 19 4.4 | 55.12 | 15 59.41 | 64.80 | 1 6.66 | 0.669 | |
| SUN. | 12 | 1 22 26.87 | 9.198 | 8 41 2.9 | 54.76 | 15 59.14 | 64.85 | 0 50.76 | 0.657 | |
| Mon. | 13 | 1 26 7.77 | 9.210 | 9 2 52.6 | +54.39 | 15 58.87 | 64.89 | 0 35.15 | 0.645 | |
| Tues. | 14 | 1 29 48.97 | 9.223 | 9 24 33.2 | 54.00 | 15 58.61 | 64.94 | 0 19.84 | 0.632 | |
| Wed. | 15 | 1 33 30.49 | 9.237 | 9 46 4.4 | 53.60 | 15 58.35 | 64.99 | 0 4.85 | 0.618 | |
| Thur. | 16 | 1 37 12.35 | 9.251 | 10 7 25.7 | +53.18 | 15 58.09 | 65.05 | 0 9.80 | 0.604 | |
| Frid. | 17 | 1 40 54.56 | 9.266 | 10 28 36.8 | 52.75 | 15 57.83 | 65.10 | 0 24.11 | 0.589 | |
| Sat. | 18 | 1 44 37.14 | 9.282 | 10 49 37.6 | 52.31 | 15 57.57 | 65.16 | 0 38.05 | 0.574 | |
| SUN. | 19 | 1 48 20.10 | 9.298 | 11 10 27.7 | +51.85 | 15 57.31 | 65.22 | 0 51.61 | 0.558 | |
| Mon. | 20 | 1 52 3.46 | 9.315 | 11 31 6.6 | 51.38 | 15 57.05 | 65.28 | 1 4.77 | 0.541 | |
| Tues. | 21 | 1 55 47.23 | 9.333 | 11 51 34.1 | 50.90 | 15 56.79 | 65.34 | 1 17.52 | 0.523 | |
| Wed. | 22 | 1 59 31.43 | 9.351 | 12 11 49.8 | +50.40 | 15 56.54 | 65.41 | 1 29.84 | 0.505 | |
| Thur. | 23 | 2 3 16.08 | 9.370 | 12 31 53.4 | 49.89 | 15 56.28 | 65.48 | 1 41.72 | 0.486 | |
| Frid. | 24 | 2 7 1.19 | 9.390 | 12 51 44.7 | 49.37 | 15 56.03 | 65.55 | 1 53.14 | 0.466 | |
| Sat. | 25 | 2 10 46.77 | 9.410 | 13 11 23.4 | +48.84 | 15 55.78 | 65.62 | 2 4.08 | 0.446 | |
| SUN. | 26 | 2 14 32.84 | 9.430 | 13 30 49.2 | 48.29 | 15 55.53 | 65.69 | 2 14.53 | 0.426 | |
| Mon. | 27 | 2 18 19.42 | 9.451 | 13 50 1.8 | 47.74 | 15 55.28 | 65.76 | 2 24.47 | 0.405 | |
| Tues. | 28 | 2 22 6.52 | 9.473 | 14 9 0.8 | +47.17 | 15 55.03 | 65.84 | 2 33.90 | 0.383 | |
| Wed. | 29 | 2 25 54.14 | 9.495 | 14 27 45.9 | 46.59 | 15 54.78 | 65.91 | 2 42.81 | 0.361 | |
| Thur. | 30 | 2 29 42.31 | 9.518 | 14 46 16.9 | 45.99 | 15 54 53 | 65.99 | 2 51.17 | 0.338 | |
| Frid. | 31 | 2 33 31.03 | 9.541 | N. 15 4 33.4 | +45.38 | 15 54.28 | 66.06 | 2 58.98 | 0.315 | |

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.18 from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, to be Subtracted from | | Sidereal Time, or Right Ascension of Mean Sun. | |
|------------------|-------------------|--|-------------------|--|-------------------|---|-------------------|--|--|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | Added to Mean Time. | Diff. for 1 Hour. | | |
| | | ^h ^m ^s | ^s | [°] ['] [″] | [″] | ^m ^s | ^s | ^h ^m ^s | |
| Wed. | 1 | 0 42 12.68 | 9.102 | N. 4 32 35.0 | +57.86 | 3 58.81 | 0.755 | 0 38 13.87 | |
| Thur. | 2 | 0 45 51.18 | 9.107 | 4 55 41.2 | 57.65 | 3 40.75 | 0.750 | 0 42 10.43 | |
| Frid. | 3 | 0 49 29.82 | 9.113 | 5 18 42.3 | 57.43 | 3 22.84 | 0.744 | 0 46 6.98 | |
| Sat. | 4 | 0 53 8.62 | 9.120 | 5 41 37.9 | +57.19 | 3 5.08 | 0.737 | 0 50 3.54 | |
| SUN. | 5 | 0 56 47.60 | 9.128 | 6 4 27.6 | 56.94 | 2 47.51 | 0.729 | 0 54 0.09 | |
| Mon. | 6 | 1 0 26.78 | 9.136 | 6 27 11.1 | 56.67 | 2 30.13 | 0.721 | 0 57 56.65 | |
| Tues. | 7 | 1 4 6.17 | 9.145 | 6 49 48.1 | +56.38 | 2 12.97 | 0.712 | 1 1 53.20 | |
| Wed. | 8 | 1 7 45.78 | 9.154 | 7 12 18.2 | 56.10 | 1 56.03 | 0.703 | 1 5 49.75 | |
| Thur. | 9 | 1 11 25.63 | 9.165 | 7 34 41.0 | 55.79 | 1 39.32 | 0.692 | 1 9 46.31 | |
| Frid. | 10 | 1 15 5.73 | 9.176 | 7 56 56.2 | +55.47 | 1 22.86 | 0.681 | 1 13 42.87 | |
| Sat. | 11 | 1 18 46.09 | 9.188 | 8 19 3.4 | 55.13 | 1 6.67 | 0.669 | 1 17 39.42 | |
| SUN. | 12 | 1 22 26.74 | 9.200 | 8 41 2.1 | 54.77 | 0 50.76 | 0.657 | 1 21 35.98 | |
| Mon. | 13 | 1 26 7.68 | 9.212 | 9 2 52.0 | +54.40 | 0 35.15 | 0.645 | 1 25 32.53 | |
| Tues. | 14 | 1 29 48.92 | 9.225 | 9 24 32.9 | 54.01 | 0 19.84 | 0.632 | 1 29 29.08 | |
| Wed. | 15 | 1 33 30.48 | 9.239 | 9 46 4.4 | 53.61 | 0 4.85 | 0.618 | 1 33 25.63 | |
| Thur. | 16 | 1 37 12.38 | 9.253 | 10 7 25.9 | +53.19 | 0 9.80 | 0.604 | 1 37 22.18 | |
| Frid. | 17 | 1 40 54.63 | 9.268 | 10 28 37.2 | 52.76 | 0 24.11 | 0.589 | 1 41 18.74 | |
| Sat. | 18 | 1 44 37.24 | 9.283 | 10 49 38.2 | 52.32 | 0 38.06 | 0.574 | 1 45 15.30 | |
| SUN. | 19 | 1 48 20.23 | 9.299 | 11 10 28.5 | +51.86 | 0 51.62 | 0.558 | 1 49 11.85 | |
| Mon. | 20 | 1 52 3.62 | 9.316 | 11 31 7.6 | 51.39 | 1 4.78 | 0.541 | 1 53 8.40 | |
| Tues. | 21 | 1 55 47.43 | 9.334 | 11 51 35.2 | 50.91 | 1 17.52 | 0.523 | 1 57 4.96 | |
| Wed. | 22 | 1 59 31.66 | 9.352 | 12 11 51.1 | +50.41 | 1 29.85 | 0.505 | 2 1 1.51 | |
| Thur. | 23 | 2 3 16.34 | 9.371 | 12 31 51.9 | 49.90 | 1 41.73 | 0.486 | 2 4 58.07 | |
| Frid. | 24 | 2 7 1.48 | 9.391 | 12 51 46.3 | 49.38 | 1 53.15 | 0.466 | 2 8 54.63 | |
| Sat. | 25 | 2 10 47.09 | 9.411 | 13 11 25.1 | +48.85 | 2 4.09 | 0.446 | 2 12 51.18 | |
| SUN. | 26 | 2 14 33.19 | 9.431 | 13 30 51.0 | 48.30 | 2 14.54 | 0.426 | 2 16 47.73 | |
| Mon. | 27 | 2 18 19.80 | 9.452 | 13 50 3.7 | 47.74 | 2 24.49 | 0.405 | 2 20 44.29 | |
| Tues. | 28 | 2 22 6.92 | 9.474 | 14 9 2.8 | +47.17 | 2 33.92 | 0.383 | 2 24 40.84 | |
| Wed. | 29 | 2 25 51.57 | 9.496 | 14 27 48.0 | 46.59 | 2 42.83 | 0.361 | 2 28 37.40 | |
| Thur. | 30 | 2 29 42.76 | 9.519 | 14 46 19.0 | 45.99 | 2 51.19 | 0.338 | 2 32 33.95 | |
| Frid. | 31 | 2 33 31.50 | 9.542 | N. 15 4 35.6 | +45.38 | 2 59.00 | 0.315 | 2 36 30.51 | |

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 hour,
+9.8565.
(Table III.)

| AT GREENWICH MEAN NOON. | | | | | | | | | |
|--|------------------|-----------------|------------|----------------------|-----------|--|----------------------|---|--|
| Day of the Month. | Day of the Year. | THE SUN'S | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 Hour. | Mean Time of Sidereal Noon. | |
| | | TRUE LONGITUDE. | | Diff. for 1 Hour. | LATITUDE. | | | | |
| | | λ | λ' | | | | | | |
| 1 | 91 | 11° 29' 4.7" | 29° 8.6" | 147.88 | — 0.20 | 9.9999155 | +53.4 | ^h 23 ^m 17 ^s 56.48 | |
| 2 | 92 | 12 28 13.0 | 28 16.8 | 147.81 | 0.30 | 0.0000440 | 53.4 | 23 14 0.57 | |
| 3 | 93 | 13 27 19.5 | 27 23.2 | 147.74 | 0.39 | 0.0001722 | 53.3 | 23 10 4.66 | |
| 4 | 94 | 14 26 24.3 | 26 27.8 | 147.66 | — 0.45 | 0.0002998 | +53.1 | 23 6 8.75 | |
| 5 | 95 | 15 25 27.2 | 25 30.6 | 147.58 | 0.48 | 0.0004269 | 52.9 | 23 2 12.84 | |
| 6 | 96 | 16 24 28.2 | 24 31.5 | 147.50 | 0.48 | 0.0005535 | 52.6 | 22 58 16.93 | |
| 7 | 97 | 17 23 27.4 | 23 30.6 | 147.42 | — 0.45 | 0.0006794 | +52.3 | 22 54 21.02 | |
| 8 | 98 | 18 22 24.7 | 22 27.8 | 147.34 | 0.39 | 0.0008044 | 51.9 | 22 50 25.11 | |
| 9 | 99 | 19 21 20.0 | 21 23.0 | 147.26 | 0.30 | 0.0009284 | 51.5 | 22 46 29.21 | |
| 10 | 100 | 20 20 13.2 | 20 16.1 | 147.17 | — 0.18 | 0.0010515 | +51.1 | 22 42 33.30 | |
| 11 | 101 | 21 19 4.3 | 19 7.1 | 147.09 | — 0.06 | 0.0011737 | 50.7 | 22 38 37.39 | |
| 12 | 102 | 22 17 53.3 | 17 56.0 | 147.00 | + 0.07 | 0.0012950 | 50.3 | 22 34 41.48 | |
| 13 | 103 | 23 16 40.1 | 16 42.7 | 146.91 | + 0.20 | 0.0014154 | +49.9 | 22 30 45.58 | |
| 14 | 104 | 24 15 24.6 | 15 27.1 | 146.81 | 0.34 | 0.0015349 | 49.6 | 22 26 49.67 | |
| 15 | 105 | 25 14 6.8 | 14 9.2 | 146.72 | 0.46 | 0.0016536 | 49.3 | 22 22 53.76 | |
| 16 | 106 | 26 12 46.8 | 12 49.1 | 146.62 | + 0.56 | 0.0017717 | +49.1 | 22 18 57.85 | |
| 17 | 107 | 27 11 24.6 | 11 26.8 | 146.53 | 0.64 | 0.0018892 | 48.9 | 22 15 1.95 | |
| 18 | 108 | 28 10 0.2 | 10 2.3 | 146.44 | 0.69 | 0.0020063 | 48.7 | 22 11 6.04 | |
| 19 | 109 | 29 8 33.6 | 8 35.5 | 146.35 | + 0.71 | 0.0021230 | +48.5 | 22 7 10.13 | |
| 20 | 110 | 30 7 4.8 | 7 6.6 | 146.26 | 0.70 | 0.0022393 | 48.4 | 22 3 14.23 | |
| 21 | 111 | 31 5 33.9 | 5 35.6 | 146.17 | 0.66 | 0.0023553 | 48.3 | 21 59 18.32 | |
| 22 | 112 | 32 4 1.1 | 4 2.7 | 146.09 | + 0.59 | 0.0024711 | +48.2 | 21 55 22.41 | |
| 23 | 113 | 33 2 26.3 | 2 27.8 | 146.01 | 0.50 | 0.0025868 | 48.1 | 21 51 26.50 | |
| 24 | 114 | 34 0 49.6 | 0 51.0 | 145.93 | 0.39 | 0.0027023 | 48.1 | 21 47 30.59 | |
| 25 | 115 | 34 59 11.1 | 59 12.3 | 145.86 | + 0.26 | 0.0028175 | +47.9 | 21 43 34.68 | |
| 26 | 116 | 35 57 30.8 | 57 31.9 | 145.79 | + 0.13 | 0.0029324 | 47.8 | 21 39 38.77 | |
| 27 | 117 | 36 55 48.9 | 55 49.9 | 145.72 | 0.00 | 0.0030468 | 47.6 | 21 35 42.86 | |
| 28 | 118 | 37 54 5.4 | 54 6.3 | 145.66 | — 0.12 | 0.0031607 | +47.3 | 21 31 46.95 | |
| 29 | 119 | 38 52 20.4 | 52 21.1 | 145.59 | 0.23 | 0.0032740 | 47.0 | 21 27 51.05 | |
| 30 | 120 | 39 50 33.8 | 50 34.4 | 145.53 | 0.32 | 0.0033866 | 46.6 | 21 23 55.14 | |
| 31 | 121 | 40 48 45.8 | 48 46.2 | 145.47 | — 0.39 | 0.0034983 | +46.2 | 21 19 59.23 | |
| NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^h .0. | | | | | | | | Diff. for 1 Hour, — 9 ^s .8296. (Table II.) | |

GREENWICH MEAN TIME.

THE MOON'S

| Day of the Month. | SEMIDIAMETER. | | HORIZONTAL PARALLAX. | | | | UPPER TRANSIT. | | AGE. |
|-------------------|---------------|-----------|----------------------|-------------------|-----------|-------------------|---------------------------|-------------------|--------------|
| | Noon. | Midnight. | Noon. | Diff. for 1 Hour. | Midnight. | Diff. for 1 Hour. | Meridian of Greenwich. | Diff. for 1 Hour. | Noon. |
| | | | | | | | ^h ^m | ^m | ^d |
| 1 | 15 44.9 | 15 50.8 | 57 41.2 | +1.78 | 58 2.8 | +1.82 | 18 12.4 | 2.45 | 22.0 |
| 2 | 15 56.8 | 16 2.8 | 58 24.8 | 1.85 | 58 46.8 | 1.82 | 19 11.9 | 2.47 | 23.0 |
| 3 | 16 8.7 | 16 14.4 | 59 8.5 | 1.78 | 59 29.4 | 1.60 | 20 11.0 | 2.43 | 24.0 |
| 4 | 16 19.7 | 16 24.6 | 59 49.1 | +1.56 | 60 6.9 | +1.39 | 21 8.4 | 2.35 | 25.0 |
| 5 | 16 28.7 | 16 32.2 | 60 22.4 | 1.17 | 60 34.9 | 0.91 | 22 3.6 | 2.26 | 26.0 |
| 6 | 16 34.7 | 16 36.2 | 60 44.2 | +0.61 | 60 49.6 | +0.28 | 22 56.7 | 2.19 | 27.0 |
| 7 | 16 36.5 | 16 35.7 | 60 50.9 | -0.07 | 60 47.9 | -0.43 | 23 48.6 | 2.16 | 28.0 |
| 8 | 16 33.7 | 16 30.6 | 60 40.6 | 0.78 | 60 29.1 | 1.12 | 6 | | 29.0 |
| 9 | 16 26.4 | 16 21.3 | 60 13.7 | 1.43 | 59 54.8 | 1.70 | 0 40.3 | 2.16 | 0.6 |
| 10 | 16 15.3 | 16 8.7 | 59 32.9 | -1.93 | 59 8.6 | -2.10 | 1 32.5 | 2.20 | 1.6 |
| 11 | 16 1.6 | 15 54.2 | 58 42.6 | 2.21 | 58 15.5 | 2.28 | 2 25.8 | 2.25 | 2.6 |
| 12 | 15 46.4 | 15 39.2 | 57 47.9 | 2.30 | 57 20.4 | 2.26 | 3 20.3 | 2.28 | 3.6 |
| 13 | 15 31.9 | 15 24.9 | 56 53.6 | -2.19 | 56 27.8 | -2.09 | 4 15.3 | 2.28 | 4.6 |
| 14 | 15 18.3 | 15 12.2 | 56 3.6 | 1.94 | 55 41.2 | 1.78 | 5 9.9 | 2.24 | 5.6 |
| 15 | 15 6.7 | 15 1.8 | 55 20.8 | 1.60 | 55 2.8 | 1.41 | 6 2.9 | 2.15 | 6.6 |
| 16 | 14 57.5 | 14 53.9 | 54 47.1 | -1.20 | 54 34.0 | -0.99 | 6 53.3 | 2.04 | 7.6 |
| 17 | 14 51.0 | 14 48.8 | 54 23.3 | 0.78 | 54 15.2 | 0.58 | 7 40.9 | 1.92 | 8.6 |
| 18 | 14 47.3 | 14 46.4 | 54 9.5 | -0.37 | 54 6.3 | -0.18 | 8 25.7 | 1.82 | 9.6 |
| 19 | 14 46.1 | 14 46.4 | 54 5.3 | 0.00 | 54 6.4 | +0.18 | 9 8.3 | 1.74 | 10.6 |
| 20 | 14 47.3 | 14 48.6 | 54 9.7 | +0.35 | 54 14.6 | 0.49 | 9 49.4 | 1.70 | 11.6 |
| 21 | 14 50.5 | 14 52.7 | 54 21.3 | 0.63 | 54 29.6 | 0.75 | 10 29.9 | 1.69 | 12.6 |
| 22 | 14 55.3 | 14 58.3 | 54 39.2 | +0.85 | 54 49.9 | +0.94 | 11 10.7 | 1.73 | 13.6 |
| 23 | 15 1.4 | 15 4.9 | 55 1.6 | 1.02 | 55 14.2 | 1.08 | 11 52.8 | 1.80 | 14.6 |
| 24 | 15 8.5 | 15 12.2 | 55 27.4 | 1.13 | 55 41.2 | 1.17 | 12 37.1 | 1.91 | 15.6 |
| 25 | 15 16.1 | 15 20.1 | 55 55.4 | +1.20 | 56 10.0 | +1.22 | 13 24.5 | 2.05 | 16.6 |
| 26 | 15 24.1 | 15 28.2 | 56 24.8 | 1.25 | 56 39.9 | 1.27 | 14 15.4 | 2.20 | 17.6 |
| 27 | 15 32.3 | 15 36.5 | 56 55.1 | 1.28 | 57 10.4 | 1.29 | 15 10.0 | 2.33 | 18.6 |
| 28 | 15 40.7 | 15 44.9 | 57 25.8 | +1.29 | 57 41.2 | +1.29 | 16 7.3 | 2.42 | 19.6 |
| 29 | 15 49.1 | 15 53.3 | 57 56.6 | 1.28 | 58 11.9 | 1.27 | 17 6.0 | 2.44 | 20.6 |
| 30 | 15 57.4 | 16 1.4 | 58 27.0 | 1.25 | 58 41.8 | 1.22 | 18 4.3 | 2.39 | 21.6 |
| 31 | 16 5.3 | 16 9.0 | 58 56.1 | +1.17 | 59 9.6 | +1.10 | 19 0.8 | 2.30 | 22.6 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|------------------|---------------------|-------------|------------------|---------------------|------------------|---------------------|
| WEDNESDAY 1. | | | | | FRIDAY 3. | | | | |
| 0 | 18 8 5.36 | 2.4718 | S. 25° 36' 15.8" | 2.238 | 0 | 20 9 28.70 | 2.5439 | S. 24° 16' 41.4" | 5.647 |
| 1 | 18 10 33.79 | 2.4758 | 25 38 25.5 | 2.084 | 1 | 20 12 1.30 | 2.5427 | 24 10 57.7 | 5.811 |
| 2 | 18 13 2.46 | 2.4797 | 25 40 25.9 | 1.929 | 2 | 20 14 33.82 | 2.5413 | 24 5 4.1 | 5.975 |
| 3 | 18 15 31.36 | 2.4836 | 25 42 17.0 | 1.774 | 3 | 20 17 6.26 | 2.5399 | 23 59 0.7 | 6.138 |
| 4 | 18 18 0.49 | 2.4873 | 25 43 58.8 | 1.617 | 4 | 20 19 38.61 | 2.5385 | 23 52 47.5 | 6.301 |
| 5 | 18 20 29.84 | 2.4909 | 25 45 31.1 | 1.460 | 5 | 20 22 10.88 | 2.5370 | 23 46 24.5 | 6.464 |
| 6 | 18 22 59.40 | 2.4944 | 25 46 54.0 | 1.303 | 6 | 20 24 43.05 | 2.5353 | 23 39 51.8 | 6.626 |
| 7 | 18 25 29.17 | 2.4978 | 25 48 7.5 | 1.145 | 7 | 20 27 15.12 | 2.5336 | 23 33 9.4 | 6.787 |
| 8 | 18 27 59.14 | 2.5011 | 25 49 11.4 | 0.985 | 8 | 20 29 47.08 | 2.5318 | 23 26 17.4 | 6.948 |
| 9 | 18 30 29.30 | 2.5043 | 25 50 5.7 | 0.825 | 9 | 20 32 18.93 | 2.5299 | 23 19 15.7 | 7.108 |
| 10 | 18 32 59.66 | 2.5075 | 25 50 50.4 | 0.665 | 10 | 20 34 50.67 | 2.5279 | 23 12 4.4 | 7.267 |
| 11 | 18 35 30.20 | 2.5104 | 25 51 25.5 | 0.504 | 11 | 20 37 22.28 | 2.5258 | 23 4 43.6 | 7.425 |
| 12 | 18 38 0.91 | 2.5133 | 25 51 50.9 | 0.342 | 12 | 20 39 53.77 | 2.5237 | 22 57 13.4 | 7.582 |
| 13 | 18 40 31.79 | 2.5161 | 25 52 6.6 | 0.180 | 13 | 20 42 25.13 | 2.5215 | 22 49 33.7 | 7.740 |
| 14 | 18 43 2.84 | 2.5188 | 25 52 12.5 | - 0.017 | 14 | 20 44 56.35 | 2.5192 | 22 41 44.6 | 7.897 |
| 15 | 18 45 34.05 | 2.5214 | 25 52 8.6 | + 0.147 | 15 | 20 47 27.43 | 2.5168 | 22 33 46.1 | 8.053 |
| 16 | 18 48 5.41 | 2.5239 | 25 51 54.9 | 0.310 | 16 | 20 49 58.36 | 2.5143 | 22 25 38.3 | 8.207 |
| 17 | 18 50 36.92 | 2.5262 | 25 51 31.4 | 0.473 | 17 | 20 52 29.14 | 2.5118 | 22 17 21.3 | 8.360 |
| 18 | 18 53 8.56 | 2.5285 | 25 50 58.1 | 0.637 | 18 | 20 54 59.78 | 2.5093 | 22 8 55.1 | 8.513 |
| 19 | 18 55 40.34 | 2.5307 | 25 50 14.9 | 0.803 | 19 | 20 57 30.26 | 2.5068 | 22 0 19.8 | 8.665 |
| 20 | 18 58 12.24 | 2.5327 | 25 49 21.7 | 0.969 | 20 | 21 0 0.57 | 2.5038 | 21 51 35.3 | 8.817 |
| 21 | 19 0 44.26 | 2.5346 | 25 48 18.6 | 1.135 | 21 | 21 2 30.72 | 2.5011 | 21 42 41.8 | 8.968 |
| 22 | 19 3 16.39 | 2.5364 | 25 47 5.5 | 1.301 | 22 | 21 5 0.70 | 2.4983 | 21 33 39.4 | 9.115 |
| 23 | 19 5 48.63 | 2.5381 | S. 25° 45' 42.5" | 1.467 | 23 | 21 7 30.51 | 2.4953 | S. 21° 24' 28.0" | 9.263 |
| THURSDAY 2. | | | | | SATURDAY 4. | | | | |
| 0 | 19 8 20.96 | 2.5396 | S. 25° 44' 9.5" | 1.634 | 0 | 21 10 0.14 | 2.4923 | S. 21° 15' 7.8" | 9.410 |
| 1 | 19 10 53.38 | 2.5411 | 25 42 26.5 | 1.801 | 1 | 21 12 29.59 | 2.4893 | 21 5 38.8 | 9.556 |
| 2 | 19 13 25.89 | 2.5425 | 25 40 33.4 | 1.968 | 2 | 21 14 58.86 | 2.4863 | 20 56 1.1 | 9.700 |
| 3 | 19 15 58.48 | 2.5437 | 25 38 30.3 | 2.136 | 3 | 21 17 27.95 | 2.4832 | 20 46 14.8 | 9.843 |
| 4 | 19 18 31.14 | 2.5448 | 25 36 17.1 | 2.303 | 4 | 21 19 56.85 | 2.4801 | 20 36 19.9 | 9.986 |
| 5 | 19 21 3.86 | 2.5458 | 25 33 53.9 | 2.471 | 5 | 21 22 25.56 | 2.4769 | 20 26 16.5 | 10.127 |
| 6 | 19 23 36.64 | 2.5467 | 25 31 20.6 | 2.639 | 6 | 21 24 54.08 | 2.4737 | 20 16 4.6 | 10.267 |
| 7 | 19 26 9.47 | 2.5475 | 25 28 37.2 | 2.807 | 7 | 21 27 22.40 | 2.4704 | 20 5 44.4 | 10.406 |
| 8 | 19 28 42.34 | 2.5482 | 25 25 43.8 | 2.974 | 8 | 21 29 50.52 | 2.4671 | 19 55 15.9 | 10.544 |
| 9 | 19 31 15.25 | 2.5487 | 25 22 40.3 | 3.143 | 9 | 21 32 18.45 | 2.4638 | 19 44 30.1 | 10.681 |
| 10 | 19 33 48.19 | 2.5492 | 25 19 26.7 | 3.311 | 10 | 21 34 46.18 | 2.4604 | 19 33 54.2 | 10.816 |
| 11 | 19 36 21.15 | 2.5495 | 25 16 3.0 | 3.479 | 11 | 21 37 13.70 | 2.4569 | 19 23 1.2 | 10.950 |
| 12 | 19 38 54.13 | 2.5497 | 25 12 29.2 | 3.647 | 12 | 21 39 41.01 | 2.4535 | 19 12 0.2 | 11.082 |
| 13 | 19 41 27.12 | 2.5498 | 25 8 45.4 | 3.814 | 13 | 21 42 8.12 | 2.4501 | 19 0 51.3 | 11.213 |
| 14 | 19 44 0.11 | 2.5497 | 25 4 51.5 | 3.982 | 14 | 21 44 35.02 | 2.4466 | 18 49 34.6 | 11.343 |
| 15 | 19 46 33.09 | 2.5496 | 25 0 47.5 | 4.150 | 15 | 21 47 1.71 | 2.4431 | 18 38 10.1 | 11.472 |
| 16 | 19 49 6.06 | 2.5494 | 24 56 33.5 | 4.317 | 16 | 21 49 28.19 | 2.4396 | 18 26 38.0 | 11.598 |
| 17 | 19 51 39.02 | 2.5491 | 24 52 9.5 | 4.484 | 17 | 21 51 54.46 | 2.4360 | 18 14 58.3 | 11.724 |
| 18 | 19 54 11.95 | 2.5488 | 24 47 35.4 | 4.651 | 18 | 21 54 20.51 | 2.4324 | 18 3 11.1 | 11.848 |
| 19 | 19 56 44.85 | 2.5481 | 24 42 51.3 | 4.818 | 19 | 21 56 46.35 | 2.4289 | 17 51 16.5 | 11.972 |
| 20 | 19 59 17.72 | 2.5474 | 24 37 57.2 | 4.984 | 20 | 21 59 11.98 | 2.4253 | 17 39 14.5 | 12.093 |
| 21 | 20 1 50.54 | 2.5466 | 24 32 53.2 | 5.150 | 21 | 22 1 37.39 | 2.4217 | 17 27 5.3 | 12.213 |
| 22 | 20 4 23.31 | 2.5458 | 24 27 39.2 | 5.316 | 22 | 22 4 2.59 | 2.4182 | 17 14 48.9 | 12.332 |
| 23 | 20 6 56.03 | 2.5449 | 24 22 15.3 | 5.482 | 23 | 22 6 27.57 | 2.4146 | 17 2 25.4 | 12.449 |
| 24 | 20 9 28.70 | 2.5439 | S. 24° 16' 41.4" | 5.647 | 24 | 22 8 52.34 | 2.4110 | S. 16° 49' 55.0" | 12.564 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-----------|---|------------------------|------------------|------------------------|--------------|--|------------------------|----------------|------------------------|
| SUNDAY 5. | | | | | TUESDAY 7. | | | | |
| 0 | ^h 22 ^m 8 ^s 52.34 | 2.4110 | S. 16° 49' 55.0" | 12.564 | 0 | ^h 0 ^m 0 ^s 49.54 | 2.2679 | S. 5° 5' 24.8" | 16.108 |
| 1 | 22 11 16.89 | 2.4073 | 16 37 17.7 | 12.678 | 1 | 0 3 5.56 | 2.2661 | 4 49 17.4 | 16.137 |
| 2 | 22 13 41.22 | 2.4037 | 16 24 33.6 | 12.791 | 2 | 0 5 21.47 | 2.2643 | 4 33 8.3 | 16.165 |
| 3 | 22 16 5.34 | 2.4002 | 16 11 42.8 | 12.903 | 3 | 0 7 37.27 | 2.2625 | 4 16 57.6 | 16.191 |
| 4 | 22 18 29.24 | 2.3966 | 15 58 45.4 | 13.011 | 4 | 0 9 52.97 | 2.2608 | 4 0 45.4 | 16.214 |
| 5 | 22 20 52.93 | 2.3931 | 15 45 41.5 | 13.118 | 5 | 0 12 8.57 | 2.2592 | 3 44 31.9 | 16.236 |
| 6 | 22 23 16.41 | 2.3895 | 15 32 31.2 | 13.224 | 6 | 0 14 24.08 | 2.2577 | 3 28 17.1 | 16.256 |
| 7 | 22 25 39.67 | 2.3859 | 15 19 14.6 | 13.328 | 7 | 0 16 39.49 | 2.2562 | 3 12 1.2 | 16.273 |
| 8 | 22 28 2.72 | 2.3823 | 15 5 51.8 | 13.432 | 8 | 0 18 54.82 | 2.2547 | 2 55 44.3 | 16.289 |
| 9 | 22 30 25.55 | 2.3787 | 14 52 22.8 | 13.533 | 9 | 0 21 10.06 | 2.2533 | 2 39 26.5 | 16.303 |
| 10 | 22 32 48.17 | 2.3752 | 14 38 47.8 | 13.633 | 10 | 0 23 25.22 | 2.2520 | 2 23 7.9 | 16.316 |
| 11 | 22 35 10.58 | 2.3718 | 14 25 6.9 | 13.731 | 11 | 0 25 40.30 | 2.2506 | 2 6 48.6 | 16.327 |
| 12 | 22 37 32.79 | 2.3684 | 14 11 20.1 | 13.827 | 12 | 0 27 55.31 | 2.2496 | 1 50 28.7 | 16.335 |
| 13 | 22 39 54.79 | 2.3649 | 13 57 27.6 | 13.922 | 13 | 0 30 10.25 | 2.2485 | 1 34 8.4 | 16.341 |
| 14 | 22 42 16.58 | 2.3614 | 13 43 29.5 | 14.014 | 14 | 0 32 25.13 | 2.2474 | 1 17 47.8 | 16.346 |
| 15 | 22 44 38.16 | 2.3580 | 13 29 25.9 | 14.105 | 15 | 0 34 39.94 | 2.2463 | 1 1 26.9 | 16.349 |
| 16 | 22 46 59.54 | 2.3546 | 13 15 16.9 | 14.195 | 16 | 0 36 54.69 | 2.2454 | 0 45 5.9 | 16.350 |
| 17 | 22 49 20.72 | 2.3512 | 13 1 2.5 | 14.283 | 17 | 0 39 9.39 | 2.2446 | 0 28 44.9 | 16.349 |
| 18 | 22 51 41.69 | 2.3479 | 12 46 42.9 | 14.369 | 18 | 0 41 24.04 | 2.2438 | S. 0 12 24.0 | 16.347 |
| 19 | 22 54 2.47 | 2.3447 | 12 32 18.2 | 14.453 | 19 | 0 43 38.64 | 2.2430 | N. 0 3 56.7 | 16.342 |
| 20 | 22 56 23.05 | 2.3414 | 12 17 48.5 | 14.536 | 20 | 0 45 53.20 | 2.2423 | 0 20 17.1 | 16.336 |
| 21 | 22 58 43.44 | 2.3382 | 12 3 13.9 | 14.617 | 21 | 0 48 7.72 | 2.2417 | 0 36 37.0 | 16.327 |
| 22 | 23 1 3.63 | 2.3349 | 11 48 34.5 | 14.695 | 22 | 0 50 22.20 | 2.2411 | 0 52 56.4 | 16.317 |
| 23 | 23 3 23.63 | 2.3318 | S. 11 33 50.5 | 14.779 | 23 | 0 52 36.65 | 2.2406 | N. 1 9 15.1 | 16.305 |
| MONDAY 6. | | | | | WEDNESDAY 8. | | | | |
| 0 | 23 5 43.45 | 2.3287 | S. 11 19 1.9 | 14.848 | 0 | 0 54 51.07 | 2.2402 | N. 1 25 33.0 | 16.291 |
| 1 | 23 8 3.08 | 2.3257 | 11 4 8.8 | 14.932 | 1 | 0 57 5.47 | 2.2396 | 1 41 50.0 | 16.276 |
| 2 | 23 10 22.53 | 2.3226 | 10 49 11.3 | 14.993 | 2 | 0 59 19.85 | 2.2394 | 1 58 6.1 | 16.259 |
| 3 | 23 12 41.79 | 2.3196 | 10 34 9.6 | 15.063 | 3 | 1 1 34.20 | 2.2391 | 2 14 21.1 | 16.240 |
| 4 | 23 15 0.88 | 2.3167 | 10 19 3.7 | 15.132 | 4 | 1 3 48.54 | 2.2389 | 2 30 34.9 | 16.218 |
| 5 | 23 17 19.79 | 2.3138 | 10 3 53.8 | 15.198 | 5 | 1 6 2.87 | 2.2387 | 2 46 47.3 | 16.195 |
| 6 | 23 19 38.53 | 2.3109 | 9 48 40.0 | 15.264 | 6 | 1 8 17.19 | 2.2387 | 3 2 58.3 | 16.171 |
| 7 | 23 21 57.10 | 2.3081 | 9 33 22.4 | 15.325 | 7 | 1 10 31.51 | 2.2387 | 3 19 7.8 | 16.144 |
| 8 | 23 24 15.50 | 2.3053 | 9 18 1.0 | 15.387 | 8 | 1 12 45.83 | 2.2387 | 3 35 15.6 | 16.116 |
| 9 | 23 26 33.73 | 2.3025 | 9 2 36.0 | 15.446 | 9 | 1 15 0.15 | 2.2387 | 3 51 21.7 | 16.086 |
| 10 | 23 28 51.80 | 2.2999 | 8 47 7.5 | 15.503 | 10 | 1 17 14.48 | 2.2389 | 4 7 25.9 | 16.054 |
| 11 | 23 31 9.72 | 2.2973 | 8 31 35.6 | 15.558 | 11 | 1 19 28.82 | 2.2392 | 4 23 28.2 | 16.021 |
| 12 | 23 33 27.48 | 2.2947 | 8 16 0.5 | 15.612 | 12 | 1 21 43.18 | 2.2394 | 4 39 28.4 | 15.985 |
| 13 | 23 35 45.08 | 2.2922 | 8 0 22.2 | 15.663 | 13 | 1 23 57.55 | 2.2397 | 4 55 26.4 | 15.947 |
| 14 | 23 38 2.54 | 2.2898 | 7 44 40.9 | 15.713 | 14 | 1 26 11.94 | 2.2401 | 5 11 22.1 | 15.909 |
| 15 | 23 40 19.85 | 2.2873 | 7 28 56.6 | 15.762 | 15 | 1 28 26.36 | 2.2406 | 5 27 15.5 | 15.869 |
| 16 | 23 42 37.01 | 2.2849 | 7 13 9.5 | 15.807 | 16 | 1 30 40.81 | 2.2411 | 5 43 6.4 | 15.827 |
| 17 | 23 44 54.03 | 2.2826 | 6 57 19.7 | 15.851 | 17 | 1 32 55.29 | 2.2416 | 5 58 54.7 | 15.782 |
| 18 | 23 47 10.92 | 2.2803 | 6 41 27.4 | 15.893 | 18 | 1 35 9.80 | 2.2421 | 6 14 40.3 | 15.737 |
| 19 | 23 49 27.67 | 2.2781 | 6 25 32.6 | 15.934 | 19 | 1 37 24.34 | 2.2427 | 6 30 23.1 | 15.689 |
| 20 | 23 51 44.29 | 2.2760 | 6 9 35.3 | 15.973 | 20 | 1 39 38.92 | 2.2434 | 6 46 3.0 | 15.640 |
| 21 | 23 54 0.79 | 2.2739 | 5 53 35.8 | 16.010 | 21 | 1 41 53.55 | 2.2442 | 7 1 39.9 | 15.589 |
| 22 | 23 56 17.16 | 2.2718 | 5 37 34.1 | 16.045 | 22 | 1 44 8.23 | 2.2451 | 7 17 13.7 | 15.537 |
| 23 | 23 58 33.41 | 2.2698 | 5 21 30.4 | 16.078 | 23 | 1 46 22.96 | 2.2459 | 7 32 44.3 | 15.482 |
| 24 | 0 0 49.54 | 2.2679 | S. 5 5 24.8 | 16.108 | 24 | 1 48 37.74 | 2.2468 | N. 7 48 11.5 | 15.425 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|---------------------|------------------|---------------------|--------------|------------------|---------------------|------------------|---------------------|
| THURSDAY 9. | | | | | SATURDAY 11. | | | | |
| 0 | 1 48 37.74 | 2.2468 | N. 7° 48' 11.5" | 15.425 | 0 | 3 38 11.88 | 2.3268 | N. 18° 35' 25.6" | 11.090 |
| 1 | 1 50 52.58 | 2.2477 | 8 3 35.3 | 15.368 | 1 | 3 40 31.54 | 2.3267 | 18 46 23.2 | 10.866 |
| 2 | 1 53 7.47 | 2.2487 | 8 18 55.7 | 15.310 | 2 | 3 42 51.32 | 2.3306 | 18 57 13.4 | 10.775 |
| 3 | 1 55 22.42 | 2.2497 | 8 34 12.5 | 15.249 | 3 | 3 45 11.21 | 2.3324 | 19 7 56.2 | 10.651 |
| 4 | 1 57 37.44 | 2.2508 | 8 49 25.6 | 15.187 | 4 | 3 47 31.21 | 2.3343 | 19 18 31.5 | 10.507 |
| 5 | 1 59 52.52 | 2.2519 | 9 4 34.9 | 15.123 | 5 | 3 49 51.32 | 2.3362 | 19 28 59.4 | 10.402 |
| 6 | 2 2 7.67 | 2.2539 | 9 19 40.3 | 15.057 | 6 | 3 52 11.55 | 2.3380 | 19 39 19.7 | 10.275 |
| 7 | 2 4 22.90 | 2.2544 | 9 34 41.7 | 14.989 | 7 | 3 54 31.88 | 2.3397 | 19 49 32.4 | 10.147 |
| 8 | 2 6 38.20 | 2.2556 | 9 49 39.0 | 14.921 | 8 | 3 56 52.32 | 2.3415 | 19 59 37.4 | 10.018 |
| 9 | 2 8 53.57 | 2.2568 | 10 4 32.2 | 14.851 | 9 | 3 59 12.86 | 2.3429 | 20 9 34.6 | 9.888 |
| 10 | 2 11 9.02 | 2.2582 | 10 19 21.1 | 14.778 | 10 | 4 1 33.50 | 2.3449 | 20 19 24.0 | 9.758 |
| 11 | 2 13 24.56 | 2.2597 | 10 34 5.6 | 14.705 | 11 | 4 3 54.25 | 2.3466 | 20 29 5.6 | 9.626 |
| 12 | 2 15 40.18 | 2.2611 | 10 48 45.7 | 14.630 | 12 | 4 6 15.10 | 2.3483 | 20 38 39.4 | 9.497 |
| 13 | 2 17 55.89 | 2.2625 | 11 3 21.2 | 14.553 | 13 | 4 8 36.05 | 2.3499 | 20 48 5.2 | 9.364 |
| 14 | 2 20 11.68 | 2.2639 | 11 17 52.1 | 14.476 | 14 | 4 10 57.00 | 2.3514 | 20 57 23.1 | 9.231 |
| 15 | 2 22 27.56 | 2.2655 | 11 32 18.3 | 14.396 | 15 | 4 13 18.22 | 2.3529 | 21 6 33.0 | 9.097 |
| 16 | 2 24 43.54 | 2.2671 | 11 46 39.6 | 14.314 | 16 | 4 15 39.44 | 2.3544 | 21 15 34.8 | 8.963 |
| 17 | 2 26 59.61 | 2.2687 | 12 0 56.0 | 14.232 | 17 | 4 18 0.75 | 2.3559 | 21 24 28.5 | 8.827 |
| 18 | 2 29 15.78 | 2.2703 | 12 15 7.5 | 14.149 | 18 | 4 20 22.15 | 2.3573 | 21 33 14.1 | 8.692 |
| 19 | 2 31 32.05 | 2.2720 | 12 29 13.9 | 14.063 | 19 | 4 22 43.63 | 2.3587 | 21 41 51.5 | 8.555 |
| 20 | 2 33 48.42 | 2.2736 | 12 43 15.1 | 13.976 | 20 | 4 25 5.19 | 2.3600 | 21 50 20.7 | 8.418 |
| 21 | 2 36 4.88 | 2.2753 | 12 57 11.0 | 13.887 | 21 | 4 27 26.83 | 2.3614 | 21 58 41.7 | 8.281 |
| 22 | 2 38 21.45 | 2.2771 | 13 11 1.6 | 13.798 | 22 | 4 29 48.55 | 2.3627 | 22 6 54.4 | 8.149 |
| 23 | 2 40 38.13 | 2.2788 | N. 13° 24' 46.8" | 13.707 | 23 | 4 32 10.35 | 2.3639 | N. 22° 14' 58.8" | 8.003 |
| FRIDAY 10. | | | | | SUNDAY 12. | | | | |
| 0 | 2 42 54.91 | 2.2806 | N. 13° 38' 26.4" | 13.614 | 0 | 4 34 32.22 | 2.3650 | N. 22° 22' 54.8" | 7.863 |
| 1 | 2 45 11.80 | 2.2824 | 13 52 0.4 | 13.530 | 1 | 4 36 54.15 | 2.3661 | 22 30 42.4 | 7.733 |
| 2 | 2 47 28.80 | 2.2842 | 14 5 28.8 | 13.446 | 2 | 4 39 16.15 | 2.3672 | 22 38 21.6 | 7.583 |
| 3 | 2 49 45.91 | 2.2861 | 14 18 51.5 | 13.359 | 3 | 4 41 38.21 | 2.3682 | 22 45 52.4 | 7.442 |
| 4 | 2 52 3.13 | 2.2879 | 14 32 8.3 | 13.271 | 4 | 4 44 0.33 | 2.3691 | 22 53 14.7 | 7.301 |
| 5 | 2 54 20.46 | 2.2898 | 14 45 19.2 | 13.182 | 5 | 4 46 22.50 | 2.3699 | 23 0 28.5 | 7.158 |
| 6 | 2 56 37.91 | 2.2917 | 14 58 24.2 | 13.092 | 6 | 4 48 44.72 | 2.3707 | 23 7 33.7 | 7.016 |
| 7 | 2 58 55.47 | 2.2936 | 15 11 23.1 | 12.999 | 7 | 4 51 6.99 | 2.3715 | 23 14 30.4 | 6.873 |
| 8 | 3 1 13.14 | 2.2955 | 15 24 15.8 | 12.907 | 8 | 4 53 29.30 | 2.3723 | 23 21 18.5 | 6.731 |
| 9 | 3 3 30.93 | 2.2975 | 15 37 2.3 | 12.813 | 9 | 4 55 51.66 | 2.3730 | 23 27 58.1 | 6.587 |
| 10 | 3 5 48.24 | 2.2994 | 15 49 42.5 | 12.718 | 10 | 4 58 14.06 | 2.3738 | 23 34 29.0 | 6.443 |
| 11 | 3 8 6.86 | 2.3013 | 16 2 16.4 | 12.621 | 11 | 5 0 36.49 | 2.3740 | 23 40 51.3 | 6.299 |
| 12 | 3 10 25.00 | 2.3033 | 16 14 43.8 | 12.522 | 12 | 5 2 58.94 | 2.3744 | 23 47 4.0 | 6.154 |
| 13 | 3 12 43.26 | 2.3053 | 16 27 4.7 | 12.423 | 13 | 5 5 21.42 | 2.3748 | 23 53 9.8 | 6.009 |
| 14 | 3 15 1.64 | 2.3072 | 16 39 19.0 | 12.323 | 14 | 5 7 43.92 | 2.3752 | 23 59 6.0 | 5.865 |
| 15 | 3 17 20.13 | 2.3092 | 16 51 26.7 | 12.222 | 15 | 5 10 6.44 | 2.3755 | 24 4 53.6 | 5.720 |
| 16 | 3 19 38.74 | 2.3112 | 17 3 27.7 | 12.120 | 16 | 5 12 28.98 | 2.3757 | 24 10 32.4 | 5.574 |
| 17 | 3 21 57.47 | 2.3132 | 17 15 21.9 | 12.018 | 17 | 5 14 51.53 | 2.3758 | 24 16 2.5 | 5.429 |
| 18 | 3 24 16.32 | 2.3152 | 17 27 9.2 | 11.915 | 18 | 5 17 14.08 | 2.3758 | 24 21 23.9 | 5.283 |
| 19 | 3 26 35.29 | 2.3171 | 17 38 49.6 | 11.812 | 19 | 5 19 36.63 | 2.3758 | 24 26 36.5 | 5.137 |
| 20 | 3 28 54.37 | 2.3190 | 17 50 23.0 | 11.708 | 20 | 5 21 59.18 | 2.3758 | 24 31 40.3 | 4.990 |
| 21 | 3 31 13.57 | 2.3210 | 18 1 49.4 | 11.604 | 21 | 5 24 21.73 | 2.3757 | 24 36 35.3 | 4.844 |
| 22 | 3 33 32.89 | 2.3230 | 18 13 8.7 | 11.500 | 22 | 5 26 44.26 | 2.3754 | 24 41 21.6 | 4.698 |
| 23 | 3 35 52.33 | 2.3249 | 18 24 20.8 | 11.395 | 23 | 5 29 6.78 | 2.3751 | 24 45 59.1 | 4.552 |
| 24 | 3 38 11.88 | 2.3268 | N. 18° 35' 25.6" | 11.290 | 24 | 5 31 29.28 | 2.3748 | N. 24° 50' 27.8" | 4.405 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|---------------------|--------------|---------------------|---------------|------------------|---------------------|--------------|---------------------|
| MONDAY 13. | | | | | WEDNESDAY 15. | | | | |
| 0 | 5 31 29.28 | 2.3748 | N.24 50 27.8 | 4.405 | 0 | 7 23 37.97 | 2.9708 | N.25 36 20.1 | 2.351 |
| 1 | 5 33 51.76 | 2.3744 | 24 54 47.7 | 4.258 | 1 | 7 25 54.11 | 2.9671 | 25 33 55.2 | 2.480 |
| 2 | 5 36 14.21 | 2.3738 | 24 58 58.8 | 4.112 | 2 | 7 28 10.02 | 2.9633 | 25 31 22.5 | 2.609 |
| 3 | 5 38 36.62 | 2.3732 | 25 3 1.2 | 3.966 | 3 | 7 30 25.70 | 2.9594 | 25 28 42.1 | 2.737 |
| 4 | 5 40 58.99 | 2.3725 | 25 6 54.8 | 3.819 | 4 | 7 32 41.15 | 2.9556 | 25 25 54.1 | 2.863 |
| 5 | 5 43 21.32 | 2.3717 | 25 10 39.5 | 3.672 | 5 | 7 34 56.37 | 2.9517 | 25 22 58.6 | 2.988 |
| 6 | 5 45 43.60 | 2.3709 | 25 14 15.4 | 3.526 | 6 | 7 37 11.35 | 2.9477 | 25 19 55.5 | 3.114 |
| 7 | 5 48 5.83 | 2.3700 | 25 17 42.6 | 3.380 | 7 | 7 39 26.09 | 2.9437 | 25 16 44.9 | 3.239 |
| 8 | 5 50 28.00 | 2.3691 | 25 21 1.0 | 3.233 | 8 | 7 41 40.59 | 2.9396 | 25 13 26.8 | 3.363 |
| 9 | 5 52 50.12 | 2.3681 | 25 24 10.6 | 3.087 | 9 | 7 43 54.84 | 2.9355 | 25 10 1.3 | 3.488 |
| 10 | 5 55 12.17 | 2.3669 | 25 27 11.4 | 2.941 | 10 | 7 46 8.85 | 2.9314 | 25 6 28.5 | 3.608 |
| 11 | 5 57 34.15 | 2.3657 | 25 30 3.5 | 2.795 | 11 | 7 48 22.61 | 2.9273 | 25 2 48.4 | 3.730 |
| 12 | 5 59 56.06 | 2.3645 | 25 32 46.8 | 2.649 | 12 | 7 50 36.12 | 2.9231 | 24 59 0.9 | 3.852 |
| 13 | 6 2 17.89 | 2.3632 | 25 35 21.4 | 2.504 | 13 | 7 52 49.38 | 2.9189 | 24 55 6.2 | 3.971 |
| 14 | 6 4 39.63 | 2.3617 | 25 37 47.3 | 2.358 | 14 | 7 55 2.38 | 2.9145 | 24 51 4.4 | 4.090 |
| 15 | 6 7 1.29 | 2.3602 | 25 40 4.4 | 2.212 | 15 | 7 57 15.12 | 2.9102 | 24 46 55.4 | 4.209 |
| 16 | 6 9 22.86 | 2.3586 | 25 42 12.8 | 2.066 | 16 | 7 59 27.61 | 2.9059 | 24 42 39.3 | 4.327 |
| 17 | 6 11 44.33 | 2.3569 | 25 44 12.6 | 1.921 | 17 | 8 1 39.83 | 2.9015 | 24 38 16.2 | 4.444 |
| 18 | 6 14 5.69 | 2.3552 | 25 46 3.7 | 1.775 | 18 | 8 3 51.79 | 2.1972 | 24 33 46.0 | 4.561 |
| 19 | 6 16 26.95 | 2.3534 | 25 47 46.1 | 1.635 | 19 | 8 6 3.49 | 2.1998 | 24 29 8.9 | 4.676 |
| 20 | 6 18 48.10 | 2.3515 | 25 49 19.9 | 1.492 | 20 | 8 8 14.92 | 2.1883 | 24 24 24.9 | 4.791 |
| 21 | 6 21 9.13 | 2.3495 | 25 50 45.1 | 1.348 | 21 | 8 10 26.09 | 2.1839 | 24 19 34.0 | 4.905 |
| 22 | 6 23 30.04 | 2.3475 | 25 52 1.7 | 1.205 | 22 | 8 12 36.99 | 2.1794 | 24 14 36.3 | 5.018 |
| 23 | 6 25 50.83 | 2.3454 | N.25 53 9.7 | 1.062 | 23 | 8 14 47.62 | 2.1749 | N.24 9 31.9 | 5.130 |
| TUESDAY 14. | | | | | THURSDAY 16. | | | | |
| 0 | 6 28 11.49 | 2.3432 | N.25 54 9.1 | 0.910 | 0 | 8 16 57.98 | 2.1704 | N.24 4 20.7 | 5.242 |
| 1 | 6 30 32.01 | 2.3409 | 25 55 0.0 | 0.777 | 1 | 8 19 8.07 | 2.1659 | 23 59 2.8 | 5.359 |
| 2 | 6 32 52.46 | 2.3386 | 25 55 42.4 | 0.636 | 2 | 8 21 17.89 | 2.1614 | 23 53 38.4 | 5.469 |
| 3 | 6 35 12.65 | 2.3363 | 25 56 16.3 | 0.494 | 3 | 8 23 27.44 | 2.1568 | 23 48 7.4 | 5.571 |
| 4 | 6 37 32.75 | 2.3338 | 25 56 41.7 | 0.353 | 4 | 8 25 36.71 | 2.1522 | 23 42 29.9 | 5.679 |
| 5 | 6 39 52.70 | 2.3313 | 25 56 58.7 | 0.212 | 5 | 8 27 45.71 | 2.1477 | 23 36 45.9 | 5.787 |
| 6 | 6 42 12.50 | 2.3286 | 25 57 7.3 | + 0.074 | 6 | 8 29 54.44 | 2.1432 | 23 30 55.5 | 5.893 |
| 7 | 6 44 32.14 | 2.3259 | 25 57 7.6 | - 0.065 | 7 | 8 32 2.89 | 2.1386 | 23 24 58.7 | 5.999 |
| 8 | 6 46 51.61 | 2.3233 | 25 56 59.5 | 0.205 | 8 | 8 34 11.07 | 2.1340 | 23 18 55.6 | 6.104 |
| 9 | 6 49 10.92 | 2.3204 | 25 56 43.0 | 0.344 | 9 | 8 36 18.97 | 2.1293 | 23 12 46.2 | 6.208 |
| 10 | 6 51 30.06 | 2.3175 | 25 56 18.2 | 0.482 | 10 | 8 38 26.59 | 2.1247 | 23 6 30.6 | 6.312 |
| 11 | 6 53 49.02 | 2.3146 | 25 55 45.2 | 0.618 | 11 | 8 40 33.94 | 2.1202 | 23 0 8.8 | 6.414 |
| 12 | 6 56 7.81 | 2.3117 | 25 55 4.0 | 0.755 | 12 | 8 42 41.01 | 2.1156 | 22 53 40.9 | 6.516 |
| 13 | 6 58 26.42 | 2.3086 | 25 54 14.6 | 0.892 | 13 | 8 44 47.81 | 2.1110 | 22 47 6.9 | 6.617 |
| 14 | 7 0 44.84 | 2.3054 | 25 53 17.0 | 1.028 | 14 | 8 46 54.33 | 2.1063 | 22 40 26.9 | 6.717 |
| 15 | 7 3 3.06 | 2.3021 | 25 52 11.3 | 1.163 | 15 | 8 49 0.57 | 2.1017 | 22 33 40.9 | 6.816 |
| 16 | 7 5 21.09 | 2.2988 | 25 50 57.5 | 1.298 | 16 | 8 51 6.54 | 2.0972 | 22 26 49.0 | 6.914 |
| 17 | 7 7 38.92 | 2.2956 | 25 49 35.6 | 1.432 | 17 | 8 53 12.23 | 2.0926 | 22 19 51.2 | 7.012 |
| 18 | 7 9 56.56 | 2.2923 | 25 48 5.7 | 1.565 | 18 | 8 55 17.65 | 2.0880 | 22 12 47.6 | 7.108 |
| 19 | 7 12 13.99 | 2.2889 | 25 46 27.8 | 1.697 | 19 | 8 57 22.79 | 2.0834 | 22 5 38.2 | 7.204 |
| 20 | 7 14 31.21 | 2.2854 | 25 44 42.0 | 1.829 | 20 | 8 59 27.66 | 2.0788 | 21 58 23.1 | 7.299 |
| 21 | 7 16 48.23 | 2.2818 | 25 42 48.3 | 1.961 | 21 | 9 1 32.25 | 2.0742 | 21 51 2.3 | 7.393 |
| 22 | 7 19 5.03 | 2.2783 | 25 40 46.7 | 2.092 | 22 | 9 3 36.57 | 2.0697 | 21 43 35.9 | 7.487 |
| 23 | 7 21 21.61 | 2.2745 | 25 38 37.3 | 2.222 | 23 | 9 5 40.62 | 2.0652 | 21 36 3.8 | 7.581 |
| 24 | 7 23 37.97 | 2.2708 | N.25 36 20.1 | 2.351 | 24 | 9 7 44.40 | 2.0607 | N.21 28 26.2 | 7.679 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|--------------|---------------------|------------|------------------|---------------------|--------------|---------------------|
| FRIDAY 17. | | | | | SUNDAY 19. | | | | |
| 0 | 9 7 44.40 | 2.0607 | N.21 28 26.2 | 7.672 | 0 | 10 41 56.17 | 1.8778 | N.13 49 26.0 | 11.159 |
| 1 | 9 9 47.90 | 2.0563 | 21 20 43.1 | 7.763 | 1 | 10 43 48.75 | 1.8750 | 13 38 14.8 | 11.213 |
| 2 | 9 11 51.14 | 2.0517 | 21 12 54.6 | 7.853 | 2 | 10 45 41.17 | 1.8722 | 13 27 0.4 | 11.266 |
| 3 | 9 13 54.11 | 2.0472 | 21 5 0.7 | 7.943 | 3 | 10 47 33.42 | 1.8695 | 13 15 42.8 | 11.319 |
| 4 | 9 15 56.81 | 2.0428 | 20 57 1.4 | 8.031 | 4 | 10 49 25.51 | 1.8668 | 13 4 22.1 | 11.372 |
| 5 | 9 17 59.25 | 2.0384 | 20 48 56.9 | 8.118 | 5 | 10 51 17.44 | 1.8642 | 12 52 58.2 | 11.424 |
| 6 | 9 20 1.42 | 2.0340 | 20 40 47.2 | 8.205 | 6 | 10 53 9.22 | 1.8617 | 12 41 31.2 | 11.475 |
| 7 | 9 22 3.33 | 2.0296 | 20 32 32.3 | 8.292 | 7 | 10 55 0.84 | 1.8592 | 12 30 1.2 | 11.524 |
| 8 | 9 24 4.97 | 2.0252 | 20 24 12.2 | 8.376 | 8 | 10 56 52.32 | 1.8567 | 12 18 28.3 | 11.573 |
| 9 | 9 26 6.35 | 2.0208 | 20 15 46.9 | 8.463 | 9 | 10 58 43.65 | 1.8543 | 12 6 52.4 | 11.622 |
| 10 | 9 28 7.47 | 2.0165 | 20 7 16.6 | 8.546 | 10 | 11 0 34.84 | 1.8520 | 11 55 13.6 | 11.671 |
| 11 | 9 30 8.33 | 2.0122 | 19 58 41.4 | 8.629 | 11 | 11 2 25.89 | 1.8497 | 11 43 31.9 | 11.718 |
| 12 | 9 32 8.93 | 2.0079 | 19 50 1.2 | 8.711 | 12 | 11 4 16.80 | 1.8474 | 11 31 47.4 | 11.765 |
| 13 | 9 34 9.28 | 2.0037 | 19 41 16.1 | 8.793 | 13 | 11 6 7.58 | 1.8452 | 11 20 0.1 | 11.811 |
| 14 | 9 36 9.37 | 1.9994 | 19 32 26.1 | 8.873 | 14 | 11 7 58.23 | 1.8431 | 11 8 10.1 | 11.856 |
| 15 | 9 38 9.21 | 1.9952 | 19 23 31.3 | 8.953 | 15 | 11 9 48.75 | 1.8410 | 10 56 17.4 | 11.900 |
| 16 | 9 40 8.80 | 1.9911 | 19 14 31.8 | 9.033 | 16 | 11 11 39.15 | 1.8390 | 10 44 22.1 | 11.944 |
| 17 | 9 42 8.14 | 1.9870 | 19 5 27.5 | 9.111 | 17 | 11 13 29.43 | 1.8371 | 10 32 24.2 | 11.988 |
| 18 | 9 44 7.24 | 1.9829 | 18 56 18.5 | 9.188 | 18 | 11 15 19.60 | 1.8352 | 10 20 23.6 | 12.031 |
| 19 | 9 46 6.09 | 1.9788 | 18 47 4.9 | 9.264 | 19 | 11 17 9.65 | 1.8333 | 10 8 20.5 | 12.072 |
| 20 | 9 48 4.70 | 1.9747 | 18 37 46.8 | 9.340 | 20 | 11 18 59.59 | 1.8314 | 9 56 15.0 | 12.113 |
| 21 | 9 50 3.06 | 1.9707 | 18 28 24.1 | 9.416 | 21 | 11 20 49.42 | 1.8297 | 9 44 7.0 | 12.153 |
| 22 | 9 52 1.19 | 1.9668 | 18 18 56.9 | 9.490 | 22 | 11 22 39.15 | 1.8280 | 9 31 56.6 | 12.192 |
| 23 | 9 53 59.08 | 1.9628 | N.18 9 25.3 | 9.563 | 23 | 11 24 28.78 | 1.8264 | N. 9 19 43.9 | 12.232 |
| SATURDAY 18. | | | | | MONDAY 20. | | | | |
| 0 | 9 55 56.73 | 1.9589 | N.17 59 49.3 | 9.636 | 0 | 11 26 18.32 | 1.8246 | N. 9 7 28.8 | 12.271 |
| 1 | 9 57 54.15 | 1.9551 | 17 50 8.9 | 9.708 | 1 | 11 28 7.76 | 1.8229 | 8 55 11.4 | 12.308 |
| 2 | 9 59 51.34 | 1.9513 | 17 40 24.3 | 9.779 | 2 | 11 29 57.11 | 1.8218 | 8 42 51.8 | 12.344 |
| 3 | 10 1 48.31 | 1.9476 | 17 30 35.4 | 9.850 | 3 | 11 31 46.38 | 1.8205 | 8 30 30.1 | 12.380 |
| 4 | 10 3 45.05 | 1.9438 | 17 20 42.3 | 9.919 | 4 | 11 33 35.57 | 1.8191 | 8 18 6.2 | 12.416 |
| 5 | 10 5 41.56 | 1.9400 | 17 10 45.1 | 9.988 | 5 | 11 35 24.67 | 1.8177 | 8 5 40.2 | 12.452 |
| 6 | 10 7 37.85 | 1.9363 | 17 0 43.7 | 10.057 | 6 | 11 37 13.69 | 1.8164 | 7 53 12.0 | 12.486 |
| 7 | 10 9 33.92 | 1.9327 | 16 50 38.3 | 10.124 | 7 | 11 39 2.64 | 1.8153 | 7 40 41.8 | 12.519 |
| 8 | 10 11 29.78 | 1.9292 | 16 40 28.9 | 10.191 | 8 | 11 40 51.53 | 1.8142 | 7 28 9.7 | 12.552 |
| 9 | 10 13 25.42 | 1.9256 | 16 30 15.4 | 10.257 | 9 | 11 42 40.35 | 1.8132 | 7 15 35.6 | 12.584 |
| 10 | 10 15 20.85 | 1.9221 | 16 19 58.0 | 10.322 | 10 | 11 44 29.11 | 1.8122 | 7 2 59.6 | 12.615 |
| 11 | 10 17 16.07 | 1.9187 | 16 9 36.7 | 10.387 | 11 | 11 46 17.81 | 1.8112 | 6 50 21.8 | 12.646 |
| 12 | 10 19 11.09 | 1.9153 | 15 59 11.6 | 10.450 | 12 | 11 48 6.45 | 1.8103 | 6 37 4.1 | 12.677 |
| 13 | 10 21 5.91 | 1.9119 | 15 48 42.7 | 10.513 | 13 | 11 49 55.04 | 1.8094 | 6 25 0.6 | 12.706 |
| 14 | 10 23 0.52 | 1.9085 | 15 38 10.0 | 10.576 | 14 | 11 51 43.58 | 1.8087 | 6 12 17.4 | 12.733 |
| 15 | 10 24 54.93 | 1.9052 | 15 27 33.6 | 10.637 | 15 | 11 53 32.08 | 1.8080 | 5 59 32.6 | 12.761 |
| 16 | 10 26 49.15 | 1.9020 | 15 16 53.6 | 10.698 | 16 | 11 55 20.54 | 1.8073 | 5 46 46.1 | 12.788 |
| 17 | 10 28 43.17 | 1.8988 | 15 6 9.0 | 10.758 | 17 | 11 57 8.96 | 1.8067 | 5 33 58.0 | 12.816 |
| 18 | 10 30 37.00 | 1.8957 | 14 55 22.6 | 10.817 | 18 | 11 58 57.35 | 1.8062 | 5 21 8.2 | 12.842 |
| 19 | 10 32 30.65 | 1.8926 | 14 44 31.8 | 10.876 | 19 | 12 0 45.71 | 1.8057 | 5 8 16.9 | 12.867 |
| 20 | 10 34 24.11 | 1.8895 | 14 33 37.5 | 10.934 | 20 | 12 2 34.04 | 1.8052 | 4 55 24.2 | 12.891 |
| 21 | 10 36 17.39 | 1.8865 | 14 22 30.7 | 10.992 | 21 | 12 4 22.31 | 1.8048 | 4 42 30.0 | 12.915 |
| 22 | 10 38 10.49 | 1.8836 | 14 11 38.5 | 11.048 | 22 | 12 6 10.62 | 1.8046 | 4 29 34.4 | 12.938 |
| 23 | 10 40 3.42 | 1.8807 | 14 0 33.9 | 11.104 | 23 | 12 7 58.89 | 1.8044 | 4 16 37.5 | 12.960 |
| 24 | 10 41 56.17 | 1.8778 | N.13 49 26.0 | 11.159 | 24 | 12 9 47.15 | 1.8043 | N. 4 3 39.2 | 12.982 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|------------------|---------------------|--------------|---------------------|--------------|------------------|---------------------|---------------|---------------------|
| TUESDAY 21. | | | | | THURSDAY 23. | | | | |
| 0 | 12 9 47.15 | 1.8043 | N. 4 3 39.2 | 12.989 | 0 | 13 37 21.07 | 1.8681 | S. 6 30 5.6 | 13.119 |
| 1 | 12 11 35.40 | 1.8049 | 3 50 39.7 | 13.003 | 1 | 13 39 13.24 | 1.8709 | 6 43 12.2 | 13.101 |
| 2 | 12 13 23.65 | 1.8041 | 3 37 38.9 | 13.023 | 2 | 13 41 5.58 | 1.8737 | 6 56 17.7 | 13.089 |
| 3 | 12 15 11.89 | 1.8041 | 3 24 36.9 | 13.042 | 3 | 13 42 58.09 | 1.8767 | 7 9 22.1 | 13.063 |
| 4 | 12 17 0.14 | 1.8049 | 3 11 33.8 | 13.061 | 4 | 13 44 50.78 | 1.8798 | 7 22 25.3 | 13.043 |
| 5 | 12 18 48.39 | 1.8043 | 2 58 29.6 | 13.079 | 5 | 13 46 43.66 | 1.8829 | 7 35 27.3 | 13.029 |
| 6 | 12 20 36.65 | 1.8045 | 2 45 24.4 | 13.096 | 6 | 13 48 36.73 | 1.8861 | 7 48 27.9 | 12.999 |
| 7 | 12 22 24.93 | 1.8047 | 2 32 18.1 | 13.113 | 7 | 13 50 29.99 | 1.8892 | 8 1 27.2 | 12.976 |
| 8 | 12 24 13.22 | 1.8050 | 2 19 10.8 | 13.128 | 8 | 13 52 23.44 | 1.8924 | 8 14 25.1 | 12.959 |
| 9 | 12 26 1.53 | 1.8054 | 2 6 2.7 | 13.143 | 9 | 13 54 17.08 | 1.8957 | 8 27 21.5 | 12.937 |
| 10 | 12 27 49.87 | 1.8058 | 1 52 53.7 | 13.158 | 10 | 13 56 10.92 | 1.8991 | 8 40 16.3 | 12.901 |
| 11 | 12 29 38.23 | 1.8062 | 1 39 43.8 | 13.172 | 11 | 13 58 4.97 | 1.9026 | 8 53 9.6 | 12.874 |
| 12 | 12 31 26.62 | 1.8068 | 1 26 33.1 | 13.184 | 12 | 13 59 59.23 | 1.9061 | 9 6 1.2 | 12.846 |
| 13 | 12 33 15.05 | 1.8075 | 1 13 21.7 | 13.196 | 13 | 14 1 53.70 | 1.9097 | 9 18 51.1 | 12.817 |
| 14 | 12 35 3.52 | 1.8082 | 1 0 9.6 | 13.207 | 14 | 14 3 48.39 | 1.9133 | 9 31 39.3 | 12.787 |
| 15 | 12 36 52.03 | 1.8089 | 0 46 56.8 | 13.218 | 15 | 14 5 43.29 | 1.9169 | 9 44 25.6 | 12.756 |
| 16 | 12 38 40.59 | 1.8097 | 0 33 43.4 | 13.228 | 16 | 14 7 38.42 | 1.9207 | 9 57 10.0 | 12.724 |
| 17 | 12 40 29.20 | 1.8106 | 0 20 29.4 | 13.237 | 17 | 14 9 33.77 | 1.9244 | 10 9 52.5 | 12.692 |
| 18 | 12 42 17.86 | 1.8115 | N. 0 7 14.9 | 13.246 | 18 | 14 11 29.35 | 1.9282 | 10 22 33.0 | 12.658 |
| 19 | 12 44 6.58 | 1.8125 | N. 0 6 0.1 | 13.253 | 19 | 14 13 25.16 | 1.9322 | 10 35 11.4 | 12.623 |
| 20 | 12 45 55.36 | 1.8135 | 0 19 15.5 | 13.260 | 20 | 14 15 21.21 | 1.9362 | 10 47 47.7 | 12.587 |
| 21 | 12 47 44.20 | 1.8146 | 0 32 31.3 | 13.266 | 21 | 14 17 17.50 | 1.9402 | 11 0 21.8 | 12.549 |
| 22 | 12 49 33.11 | 1.8158 | 0 45 47.4 | 13.271 | 22 | 14 19 14.03 | 1.9442 | 11 12 53.6 | 12.511 |
| 23 | 12 51 22.10 | 1.8171 | N. 0 59 3.8 | 13.276 | 23 | 14 21 10.81 | 1.9484 | S. 11 25 23.1 | 12.473 |
| WEDNESDAY 22. | | | | | FRIDAY 24. | | | | |
| 0 | 12 53 11.16 | 1.8184 | S. 1 12 20.5 | 13.280 | 0 | 14 23 7.84 | 1.9526 | S. 11 37 50.3 | 12.439 |
| 1 | 12 55 0.30 | 1.8196 | 1 25 37.4 | 13.282 | 1 | 14 25 5.12 | 1.9568 | 11 50 15.0 | 12.391 |
| 2 | 12 56 49.53 | 1.8212 | 1 38 54.4 | 13.284 | 2 | 14 27 2.66 | 1.9611 | 12 2 37.2 | 12.348 |
| 3 | 12 58 38.84 | 1.8226 | 1 52 11.5 | 13.286 | 3 | 14 29 0.45 | 1.9654 | 12 14 56.8 | 12.305 |
| 4 | 13 0 28.24 | 1.8242 | 2 5 28.7 | 13.288 | 4 | 14 30 58.50 | 1.9698 | 12 27 13.8 | 12.261 |
| 5 | 13 2 17.74 | 1.8257 | 2 18 45.8 | 13.285 | 5 | 14 32 56.82 | 1.9742 | 12 39 28.1 | 12.215 |
| 6 | 13 4 7.33 | 1.8273 | 2 32 2.9 | 13.284 | 6 | 14 34 55.41 | 1.9787 | 12 51 39.6 | 12.168 |
| 7 | 13 5 57.02 | 1.8291 | 2 45 19.9 | 13.282 | 7 | 14 36 54.27 | 1.9833 | 13 3 48.3 | 12.121 |
| 8 | 13 7 46.82 | 1.8310 | 2 58 36.7 | 13.279 | 8 | 14 38 53.41 | 1.9879 | 13 15 54.1 | 12.073 |
| 9 | 13 9 36.74 | 1.8329 | 3 11 53.4 | 13.276 | 9 | 14 40 52.82 | 1.9925 | 13 27 56.9 | 12.021 |
| 10 | 13 11 26.77 | 1.8348 | 3 25 9.8 | 13.271 | 10 | 14 42 52.51 | 1.9972 | 13 39 56.6 | 11.970 |
| 11 | 13 13 16.91 | 1.8367 | 3 38 25.9 | 13.266 | 11 | 14 44 52.49 | 2.0020 | 13 51 53.3 | 11.918 |
| 12 | 13 15 7.17 | 1.8388 | 3 51 41.7 | 13.260 | 12 | 14 46 52.75 | 2.0068 | 14 3 46.8 | 11.865 |
| 13 | 13 16 57.56 | 1.8409 | 4 4 57.1 | 13.253 | 13 | 14 48 53.30 | 2.0116 | 14 15 37.1 | 11.811 |
| 14 | 13 18 48.08 | 1.8430 | 4 18 12.0 | 13.245 | 14 | 14 50 54.14 | 2.0165 | 14 27 24.1 | 11.755 |
| 15 | 13 20 38.72 | 1.8452 | 4 31 26.5 | 13.237 | 15 | 14 52 55.28 | 2.0214 | 14 39 7.7 | 11.698 |
| 16 | 13 22 29.50 | 1.8475 | 4 44 40.4 | 13.227 | 16 | 14 54 56.71 | 2.0264 | 14 50 47.8 | 11.640 |
| 17 | 13 24 20.42 | 1.8498 | 4 57 53.7 | 13.216 | 17 | 14 56 58.45 | 2.0315 | 15 2 24.5 | 11.582 |
| 18 | 13 26 11.48 | 1.8522 | 5 11 6.3 | 13.204 | 18 | 14 59 0.49 | 2.0366 | 15 13 57.6 | 11.523 |
| 19 | 13 28 2.69 | 1.8547 | 5 24 18.2 | 13.192 | 19 | 15 1 2.84 | 2.0417 | 15 25 27.1 | 11.460 |
| 20 | 13 29 54.05 | 1.8573 | 5 37 29.1 | 13.180 | 20 | 15 3 5.49 | 2.0468 | 15 36 52.8 | 11.397 |
| 21 | 13 31 45.57 | 1.8599 | 5 50 39.8 | 13.168 | 21 | 15 5 8.45 | 2.0519 | 15 48 14.7 | 11.333 |
| 22 | 13 33 37.24 | 1.8625 | 6 3 49.3 | 13.151 | 22 | 15 7 11.72 | 2.0572 | 15 59 32.8 | 11.268 |
| 23 | 13 35 29.07 | 1.8653 | 6 16 57.9 | 13.136 | 23 | 15 9 15.31 | 2.0625 | 16 10 46.9 | 11.209 |
| 24 | 13 37 21.07 | 1.8681 | S. 6 30 5.6 | 13.119 | 24 | 15 11 19.22 | 2.0678 | S. 16 21 57.0 | 11.135 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|------------------|---------------------|-------------|------------------|---------------------|------------------|---------------------|
| SATURDAY 25. | | | | | MONDAY 27. | | | | |
| 0 | 15 11 19.22 | 2.0678 | S. 16° 21' 57.0" | 11.135 | 0 | 16 57 6.00 | 2.3407 | S. 23° 35' 26.4" | 6.450 |
| 1 | 15 13 23.45 | 2.0739 | 16 33 3.1 | 11.067 | 1 | 16 59 26.60 | 2.3460 | 23 41 49.6 | 6.392 |
| 2 | 15 15 28.00 | 2.0785 | 16 44 5.0 | 10.997 | 2 | 17 1 47.52 | 2.3513 | 23 48 5.0 | 6.193 |
| 3 | 15 17 32.87 | 2.0830 | 16 55 2.7 | 10.926 | 3 | 17 4 8.76 | 2.3566 | 23 54 12.7 | 6.063 |
| 4 | 15 19 38.07 | 2.0883 | 17 5 56.1 | 10.853 | 4 | 17 6 30.31 | 2.3619 | 24 0 12.6 | 5.939 |
| 5 | 15 21 43.59 | 2.0947 | 17 16 45.1 | 10.780 | 5 | 17 8 52.18 | 2.3671 | 24 6 4.6 | 5.800 |
| 6 | 15 23 49.44 | 2.1003 | 17 27 29.7 | 10.706 | 6 | 17 11 14.36 | 2.3722 | 24 11 48.6 | 5.667 |
| 7 | 15 25 55.63 | 2.1059 | 17 38 9.8 | 10.630 | 7 | 17 13 36.84 | 2.3773 | 24 17 24.6 | 5.533 |
| 8 | 15 28 2.15 | 2.1114 | 17 48 45.3 | 10.552 | 8 | 17 15 59.62 | 2.3822 | 24 22 52.5 | 5.398 |
| 9 | 15 30 9.00 | 2.1170 | 17 59 16.1 | 10.474 | 9 | 17 18 22.71 | 2.3872 | 24 28 12.3 | 5.269 |
| 10 | 15 32 16.19 | 2.1227 | 18 9 42.2 | 10.395 | 10 | 17 20 46.09 | 2.3921 | 24 33 23.9 | 5.133 |
| 11 | 15 34 23.72 | 2.1283 | 18 20 3.5 | 10.315 | 11 | 17 23 9.76 | 2.3969 | 24 38 27.1 | 4.984 |
| 12 | 15 36 31.59 | 2.1340 | 18 30 20.0 | 10.233 | 12 | 17 25 33.72 | 2.4017 | 24 43 22.0 | 4.845 |
| 13 | 15 38 39.80 | 2.1397 | 18 40 31.5 | 10.150 | 13 | 17 27 57.97 | 2.4064 | 24 48 8.5 | 4.705 |
| 14 | 15 40 48.35 | 2.1454 | 18 50 38.0 | 10.065 | 14 | 17 30 22.49 | 2.4109 | 24 52 46.6 | 4.564 |
| 15 | 15 42 57.25 | 2.1512 | 19 0 39.3 | 9.979 | 15 | 17 32 47.28 | 2.4154 | 24 57 16.2 | 4.422 |
| 16 | 15 45 6.49 | 2.1569 | 19 10 35.4 | 9.892 | 16 | 17 35 12.34 | 2.4199 | 25 1 37.2 | 4.278 |
| 17 | 15 47 16.08 | 2.1627 | 19 20 26.3 | 9.804 | 17 | 17 37 37.67 | 2.4243 | 25 5 49.5 | 4.133 |
| 18 | 15 49 26.02 | 2.1685 | 19 30 11.9 | 9.715 | 18 | 17 40 3.26 | 2.4287 | 25 9 53.1 | 3.988 |
| 19 | 15 51 36.30 | 2.1743 | 19 39 52.1 | 9.624 | 19 | 17 42 29.11 | 2.4329 | 25 13 48.0 | 3.842 |
| 20 | 15 53 46.93 | 2.1801 | 19 49 26.8 | 9.532 | 20 | 17 44 55.21 | 2.4370 | 25 17 34.1 | 3.694 |
| 21 | 15 55 57.91 | 2.1859 | 19 58 55.0 | 9.438 | 21 | 17 47 21.55 | 2.4410 | 25 21 11.3 | 3.546 |
| 22 | 15 58 9.24 | 2.1917 | 20 8 19.3 | 9.343 | 22 | 17 49 48.13 | 2.4450 | 25 24 39.6 | 3.397 |
| 23 | 16 0 20.92 | 2.1976 | S. 20 17 37.1 | 9.248 | 23 | 17 52 14.95 | 2.4489 | S. 25 27 59.0 | 3.248 |
| SUNDAY 26. | | | | | TUESDAY 28. | | | | |
| 0 | 16 2 32.95 | 2.2034 | S. 20 26 49.1 | 9.151 | 0 | 17 54 42.00 | 2.4527 | S. 25 31 9.4 | 3.097 |
| 1 | 16 4 45.33 | 2.2093 | 20 35 55.2 | 9.052 | 1 | 17 57 9.27 | 2.4564 | 25 34 10.7 | 2.946 |
| 2 | 16 6 58.07 | 2.2151 | 20 44 55.4 | 8.953 | 2 | 17 59 36.77 | 2.4601 | 25 37 2.9 | 2.794 |
| 3 | 16 9 11.15 | 2.2209 | 20 53 49.6 | 8.854 | 3 | 18 2 4.48 | 2.4636 | 25 39 46.0 | 2.642 |
| 4 | 16 11 24.58 | 2.2268 | 21 2 37.7 | 8.750 | 4 | 18 4 32.40 | 2.4670 | 25 42 19.9 | 2.488 |
| 5 | 16 13 38.37 | 2.2327 | 21 11 19.6 | 8.647 | 5 | 18 7 0.52 | 2.4702 | 25 44 44.6 | 2.334 |
| 6 | 16 15 52.51 | 2.2386 | 21 19 55.3 | 8.543 | 6 | 18 9 28.83 | 2.4734 | 25 47 0.0 | 2.179 |
| 7 | 16 18 7.00 | 2.2444 | 21 28 24.7 | 8.437 | 7 | 18 11 57.33 | 2.4766 | 25 49 6.1 | 2.023 |
| 8 | 16 20 21.83 | 2.2502 | 21 36 47.7 | 8.329 | 8 | 18 14 26.02 | 2.4797 | 25 51 2.8 | 1.867 |
| 9 | 16 22 37.02 | 2.2561 | 21 45 4.2 | 8.221 | 9 | 18 16 54.89 | 2.4828 | 25 52 50.2 | 1.711 |
| 10 | 16 24 52.56 | 2.2618 | 21 53 14.2 | 8.112 | 10 | 18 19 23.93 | 2.4854 | 25 54 28.1 | 1.553 |
| 11 | 16 27 8.44 | 2.2676 | 22 1 17.6 | 8.001 | 11 | 18 21 53.14 | 2.4882 | 25 55 56.5 | 1.395 |
| 12 | 16 29 24.67 | 2.2734 | 22 9 14.3 | 7.888 | 12 | 18 24 22.51 | 2.4907 | 25 57 15.5 | 1.237 |
| 13 | 16 31 41.25 | 2.2792 | 22 17 4.2 | 7.775 | 13 | 18 26 52.03 | 2.4933 | 25 58 24.9 | 1.077 |
| 14 | 16 33 58.17 | 2.2849 | 22 24 47.3 | 7.661 | 14 | 18 29 21.70 | 2.4956 | 25 59 24.7 | 0.917 |
| 15 | 16 36 15.44 | 2.2907 | 22 32 23.5 | 7.545 | 15 | 18 31 51.50 | 2.4979 | 26 0 15.0 | 0.757 |
| 16 | 16 38 33.05 | 2.2963 | 22 39 52.7 | 7.428 | 16 | 18 34 21.44 | 2.5001 | 26 0 55.6 | 0.597 |
| 17 | 16 40 51.00 | 2.3019 | 22 47 14.9 | 7.310 | 17 | 18 36 51.51 | 2.5021 | 26 1 26.6 | 0.437 |
| 18 | 16 43 9.28 | 2.3075 | 22 54 29.9 | 7.190 | 18 | 18 39 21.69 | 2.5040 | 26 1 48.0 | 0.276 |
| 19 | 16 45 27.90 | 2.3131 | 23 1 37.7 | 7.070 | 19 | 18 41 51.99 | 2.5058 | 26 1 59.7 | - 0.114 |
| 20 | 16 47 46.86 | 2.3187 | 23 8 38.3 | 6.948 | 20 | 18 44 22.39 | 2.5075 | 26 2 1.6 | + 0.049 |
| 21 | 16 50 6.15 | 2.3243 | 23 15 31.5 | 6.825 | 21 | 18 46 52.89 | 2.5091 | 26 1 53.8 | 0.219 |
| 22 | 16 52 25.77 | 2.3297 | 23 22 17.3 | 6.701 | 22 | 18 49 23.48 | 2.5106 | 26 1 36.2 | 0.375 |
| 23 | 16 54 45.72 | 2.3352 | 23 28 55.6 | 6.576 | 23 | 18 51 54.16 | 2.5120 | 26 1 8.8 | 0.537 |
| 24 | 16 57 6.00 | 2.3407 | S. 23 35 26.4 | 6.450 | 24 | 18 54 24.92 | 2.5132 | S. 26 0 31.7 | 0.700 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|------------|----------------|-------------|----------------|------------|----------------|
| 1 | Spica W. | 69° 26' 47" | 2546 | 71° 6' 56" | 2533 | 72° 47' 23" | 2520 | 74° 26' 9" | 2505 |
| | Antares W. | 23 39 39 | 2599 | 25 18 35 | 2577 | 26 58 1 | 2558 | 28 37 56 | 2537 |
| | Venus E. | 57 45 26 | 2937 | 56 13 54 | 2924 | 54 42 5 | 2909 | 53 9 58 | 2895 |
| | Fomalhaut E. | 61 47 26 | 2751 | 60 11 54 | 2745 | 58 36 14 | 2741 | 57 0 28 | 2737 |
| | Sun E. | 99 38 49 | 2868 | 98 5 49 | 2852 | 96 32 29 | 2838 | 94 58 50 | 2823 |
| 2 | Spica W. | 82 56 53 | 2436 | 84 39 37 | 2422 | 86 22 40 | 2408 | 88 6 3 | 2394 |
| | Antares W. | 37 3 58 | 2449 | 38 46 23 | 2433 | 40 29 11 | 2417 | 42 12 22 | 2401 |
| | Venus E. | 45 24 59 | 2828 | 43 51 7 | 2814 | 42 16 57 | 2800 | 40 42 29 | 2788 |
| | Fomalhaut E. | 49 0 50 | 2735 | 47 24 56 | 2739 | 45 49 8 | 2746 | 44 13 29 | 2755 |
| | Sun E. | 87 5 48 | 2749 | 85 30 13 | 2734 | 83 54 18 | 2719 | 82 18 4 | 2704 |
| 3 | Spica W. | 96 47 56 | 2396 | 98 33 17 | 2313 | 100 18 58 | 2300 | 102 4 58 | 2287 |
| | Antares W. | 50 53 48 | 2396 | 52 39 10 | 2311 | 54 24 53 | 2297 | 56 10 57 | 2283 |
| | Venus E. | 32 46 7 | 2729 | 31 10 5 | 2719 | 29 33 50 | 2710 | 27 57 23 | 2702 |
| | Sun E. | 74 11 56 | 2631 | 72 33 43 | 2616 | 70 55 10 | 2602 | 69 16 18 | 2588 |
| 4 | Spica W. | 110 59 37 | 2226 | 112 47 26 | 2214 | 114 35 32 | 2203 | 116 23 55 | 2193 |
| | Antares W. | 65 6 19 | 2217 | 66 54 21 | 2204 | 68 42 42 | 2192 | 70 31 21 | 2180 |
| | Sun E. | 60 57 15 | 2522 | 59 16 32 | 2510 | 57 35 32 | 2497 | 55 54 14 | 2486 |
| 5 | Antares W. | 79 38 48 | 2129 | 81 29 3 | 2120 | 83 19 32 | 2111 | 85 10 14 | 2103 |
| | α Aquilæ W. | 43 37 11 | 2423 | 44 45 6 | 2406 | 45 55 22 | 2393 | 47 7 48 | 2384 |
| | Sun E. | 47 23 56 | 2435 | 45 41 11 | 2426 | 43 58 13 | 2417 | 42 15 3 | 2411 |
| 6 | Antares W. | 94 26 34 | 2072 | 96 18 17 | 2066 | 98 10 8 | 2062 | 100 2 5 | 2059 |
| | α Aquilæ W. | 53 37 19 | 2391 | 54 59 46 | 2396 | 56 23 27 | 2398 | 57 48 16 | 2314 |
| | Sun E. | 33 37 6 | 2387 | 31 53 12 | 2385 | 30 9 16 | 2385 | 28 25 20 | 2387 |
| 9 | Sun W. | 9 13 10 | 2756 | 10 48 34 | 2694 | 12 25 22 | 2649 | 14 3 10 | 2621 |
| | Aldebaran E. | 40 11 45 | 2183 | 38 22 52 | 2199 | 36 34 23 | 2216 | 34 46 20 | 2235 |
| | Pollux E. | 84 7 34 | 2137 | 82 17 31 | 2148 | 80 27 45 | 2160 | 78 38 17 | 2172 |
| 10 | Sun W. | 22 17 27 | 2604 | 23 56 16 | 2613 | 25 34 53 | 2624 | 27 13 15 | 2636 |
| | Pollux E. | 69 35 52 | 2242 | 67 48 27 | 2258 | 66 1 25 | 2273 | 64 14 46 | 2289 |
| | Regulus E. | 105 47 31 | 2250 | 104 0 18 | 2266 | 102 13 28 | 2281 | 100 27 0 | 2296 |
| 11 | Sun W. | 35 20 37 | 2710 | 36 57 4 | 2727 | 38 33 8 | 2744 | 40 8 49 | 2763 |
| | Pollux E. | 55 27 34 | 2375 | 53 43 23 | 2393 | 51 59 38 | 2411 | 50 16 19 | 2429 |
| | Regulus E. | 91 40 35 | 2380 | 89 56 32 | 2398 | 88 12 54 | 2416 | 86 29 42 | 2433 |
| 12 | Sun W. | 48 1 18 | 2854 | 49 34 36 | 2873 | 51 7 29 | 2893 | 52 39 57 | 2912 |
| | Mars W. | 15 36 4 | 2761 | 17 11 23 | 2777 | 18 46 21 | 2793 | 20 20 58 | 2810 |
| | Pollux E. | 41 46 20 | 2524 | 40 5 40 | 2543 | 38 25 27 | 2563 | 36 45 41 | 2583 |
| | Regulus E. | 78 0 5 | 2525 | 76 19 27 | 2544 | 74 39 15 | 2562 | 72 59 28 | 2581 |
| 13 | Sun W. | 60 16 19 | 3006 | 61 46 24 | 3024 | 63 16 7 | 3043 | 64 45 27 | 3060 |
| | Mars W. | 28 8 23 | 2899 | 29 40 43 | 2916 | 31 12 41 | 2935 | 32 44 16 | 2951 |
| | Aldebaran W. | 16 47 29 | 2896 | 18 19 53 | 2878 | 19 52 40 | 2867 | 21 25 41 | 2861 |
| | Pollux E. | 28 33 34 | 2682 | 26 56 30 | 2702 | 25 19 53 | 2724 | 23 43 45 | 2747 |
| | Regulus E. | 64 46 53 | 2672 | 63 9 36 | 2691 | 61 32 44 | 2709 | 59 56 16 | 2726 |
| | Saturn E. | 77 28 7 | 2645 | 75 50 13 | 2663 | 74 12 43 | 2680 | 72 35 36 | 2698 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|----|------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
| 1 | Spica | W. | 76° 9' 15" | 9499 | 77° 50' 40" | 9477 | 79° 32' 25" | 9484 | 81° 14' 29" | 9450 |
| | Antares | W. | 30 18 18 | 9518 | 31 59 6 | 9500 | 33 40 19 | 9489 | 35 21 57 | 9466 |
| | Venus | E. | 51 37 33 | 9889 | 50 4 51 | 9868 | 48 31 51 | 9855 | 46 58 34 | 9841 |
| | Fomalhaut | E. | 55 24 37 | 9734 | 53 48 42 | 9739 | 52 12 45 | 9739 | 50 36 47 | 9732 |
| | Sun | E. | 93 24 52 | 9808 | 91 50 35 | 9794 | 90 15 59 | 9779 | 88 41 3 | 9764 |
| 2 | Spica | W. | 89 49 46 | 9380 | 91 33 49 | 9386 | 93 18 12 | 9363 | 95 2 54 | 9339 |
| | Antares | W. | 43 55 55 | 9386 | 45 39 50 | 9370 | 47 24 8 | 9355 | 49 8 47 | 9340 |
| | Venus | E. | 39 7 45 | 9775 | 37 32 45 | 9763 | 35 57 28 | 9750 | 34 21 55 | 9738 |
| | Fomalhaut | E. | 42 38 2 | 9767 | 41 2 51 | 9764 | 39 28 2 | 9804 | 37 53 39 | 9809 |
| | Sun | E. | 80 41 30 | 9689 | 79 4 36 | 9675 | 77 27 23 | 9660 | 75 49 49 | 9646 |
| 3 | Spica | W. | 103 51 17 | 9974 | 105 37 55 | 9982 | 107 24 51 | 9949 | 109 12 5 | 9937 |
| | Antares | W. | 57 57 22 | 9969 | 59 44 7 | 9956 | 61 31 11 | 9943 | 63 18 35 | 9929 |
| | Venus | E. | 26 20 46 | 9896 | 24 44 1 | 9892 | 23 7 10 | 9890 | 21 30 17 | 9883 |
| | Sun | E. | 67 37 7 | 9674 | 65 57 36 | 9561 | 64 17 47 | 9548 | 62 37 40 | 9535 |
| 4 | Spica | W. | 118 12 33 | 9183 | 120 1 26 | 9173 | 121 50 34 | 9165 | 123 39 55 | 9156 |
| | Antares | W. | 72 20 18 | 9169 | 74 9 32 | 9159 | 75 59 2 | 9148 | 77 48 48 | 9138 |
| | Sun | E. | 54 12 41 | 9475 | 52 30 52 | 9463 | 50 48 47 | 9453 | 49 6 28 | 9444 |
| 5 | Antares | W. | 87 1 9 | 9096 | 88 52 15 | 9088 | 90 43 32 | 9082 | 92 34 59 | 9077 |
| | α Aquilæ | W. | 48 22 15 | 9797 | 49 38 33 | 9830 | 50 56 35 | 9849 | 52 16 13 | 9863 |
| | Sun | E. | 40 31 44 | 9405 | 38 48 16 | 9398 | 37 4 39 | 9394 | 35 20 55 | 9390 |
| 6 | Antares | W. | 101 54 7 | 9057 | 103 46 13 | 9055 | 105 38 22 | 9053 | 107 30 33 | 9053 |
| | α Aquilæ | W. | 59 14 8 | 9167 | 60 40 57 | 9194 | 62 8 37 | 9186 | 63 37 4 | 9161 |
| | Sun | E. | 26 41 26 | 9390 | 24 57 37 | 9394 | 23 13 54 | 9401 | 21 30 21 | 9410 |
| 9 | Sun | W. | 15 41 36 | 9604 | 17 20 25 | 9596 | 18 59 26 | 9594 | 20 38 29 | 9598 |
| | Aldebaran | E. | 32 58 44 | 9255 | 31 11 38 | 9277 | 29 25 4 | 9300 | 27 39 5 | 9325 |
| | Pollux | E. | 76 49 7 | 9185 | 75 0 17 | 9199 | 73 11 48 | 9212 | 71 23 39 | 9227 |
| 10 | Sun | W. | 28 51 21 | 9649 | 30 29 9 | 9663 | 32 6 39 | 9678 | 33 43 48 | 9693 |
| | Pollux | E. | 62 28 30 | 9306 | 60 42 39 | 9329 | 58 57 12 | 9339 | 57 12 10 | 9357 |
| | Regulus | E. | 98 40 55 | 9313 | 96 55 14 | 9328 | 95 9 56 | 9346 | 93 25 3 | 9363 |
| 11 | Sun | W. | 41 44 6 | 9780 | 43 19 0 | 9798 | 44 53 30 | 9817 | 46 27 36 | 9835 |
| | Pollux | E. | 48 33 26 | 9448 | 46 51 0 | 9467 | 45 9 0 | 9486 | 43 27 27 | 9504 |
| | Regulus | E. | 84 46 55 | 9459 | 83 4 34 | 9470 | 81 22 38 | 9489 | 79 41 9 | 9507 |
| 12 | Sun | W. | 54 12 1 | 9931 | 55 43 41 | 9950 | 57 14 57 | 9968 | 58 45 50 | 9987 |
| | Mars | W. | 21 55 13 | 9628 | 23 29 5 | 9645 | 25 2 34 | 9663 | 26 35 40 | 9681 |
| | Pollux | E. | 35 6 22 | 9602 | 33 27 30 | 9621 | 31 49 4 | 9641 | 30 11 5 | 9662 |
| | Regulus | E. | 71 20 7 | 9599 | 69 41 11 | 9618 | 68 2 40 | 9636 | 66 24 34 | 9655 |
| 13 | Sun | W. | 66 14 25 | 9078 | 67 43 1 | 9096 | 69 11 15 | 9114 | 70 39 8 | 9130 |
| | Mars | W. | 34 15 30 | 9969 | 35 46 22 | 9986 | 37 16 52 | 9993 | 38 47 1 | 9919 |
| | Aldebaran | W. | 22 58 50 | 9858 | 24 32 3 | 9859 | 26 5 15 | 9862 | 27 38 23 | 9866 |
| | Pollux | E. | 22 8 7 | 9769 | 20 32 59 | 9793 | 18 58 22 | 9818 | 17 24 17 | 9843 |
| | Regulus | E. | 58 20 11 | 9744 | 56 44 30 | 9761 | 55 9 11 | 9778 | 53 34 14 | 9795 |
| | Saturn | E. | 70 58 53 | 9714 | 69 22 32 | 9731 | 67 46 33 | 9747 | 66 10 56 | 9764 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|----|------------|----------------|-------------|----------------|------------|----------------|-------------|----------------|
| 14 | Sun | W. | 72° 6' 41" | 3147 | 73° 33' 54" | 3164 | 75° 0' 46" | 3180 | 76° 27' 19" | 3196 |
| | Aldebaran | W. | 29 11 25 | 2873 | 30 44 18 | 2889 | 32 17 0 | 2891 | 33 49 31 | 2900 |
| | Regulus | E. | 51 59 40 | 2811 | 50 25 27 | 2828 | 48 51 36 | 2845 | 47 18 6 | 2861 |
| | SATURN | E. | 64 35 41 | 2780 | 63 0 47 | 2795 | 61 26 13 | 2811 | 59 51 59 | 2825 |
| | Spica | E. | 106 3 5 | 2811 | 104 28 51 | 2826 | 102 54 57 | 2841 | 101 21 22 | 2855 |
| 15 | Sun | W. | 83 35 32 | 2968 | 85 0 21 | 2989 | 86 24 53 | 2994 | 87 49 11 | 3007 |
| | Aldebaran | W. | 41 29 5 | 2948 | 43 0 23 | 2958 | 44 31 28 | 2968 | 46 2 21 | 2977 |
| | Regulus | E. | 39 35 41 | 2939 | 38 4 11 | 2953 | 36 32 59 | 2968 | 35 2 6 | 2983 |
| | SATURN | E. | 52 5 30 | 2985 | 50 33 5 | 2998 | 49 0 56 | 2990 | 47 29 3 | 2933 |
| | Spica | E. | 93 37 56 | 2923 | 92 6 6 | 2935 | 90 34 31 | 2946 | 89 3 11 | 2958 |
| 16 | Sun | W. | 94 47 14 | 3022 | 96 10 14 | 3072 | 97 33 3 | 3081 | 98 55 41 | 3090 |
| | Aldebaran | W. | 53 33 58 | 3021 | 55 3 45 | 3028 | 56 33 23 | 3035 | 58 2 52 | 3043 |
| | Regulus | E. | 27 32 24 | 3060 | 26 3 26 | 3077 | 24 34 48 | 3096 | 23 6 33 | 3114 |
| | SATURN | E. | 39 53 20 | 3088 | 38 22 52 | 3097 | 36 52 36 | 3098 | 35 22 33 | 3017 |
| | Spica | E. | 81 30 0 | 3010 | 80 0 0 | 3019 | 78 30 11 | 3027 | 77 0 32 | 3036 |
| 17 | Sun | W. | 105 46 36 | 3425 | 107 8 24 | 3431 | 108 30 6 | 3436 | 109 51 42 | 3441 |
| | Aldebaran | W. | 65 28 16 | 3072 | 66 57 0 | 3076 | 68 25 39 | 3080 | 69 54 13 | 3084 |
| | Pollux | W. | 21 17 7 | 3087 | 22 45 32 | 3089 | 24 13 55 | 3090 | 25 42 17 | 3091 |
| | Spica | E. | 69 34 41 | 3071 | 68 5 56 | 3078 | 66 37 17 | 3089 | 65 8 45 | 3086 |
| | Antares | E. | 115 28 0 | 3092 | 113 59 4 | 3067 | 112 30 14 | 3071 | 111 1 29 | 3074 |
| 18 | Sun | W. | 116 38 33 | 3456 | 117 59 46 | 3459 | 119 20 56 | 3460 | 120 42 5 | 3462 |
| | Aldebaran | W. | 77 16 0 | 3097 | 78 44 13 | 3099 | 80 12 24 | 3100 | 81 40 34 | 3101 |
| | Pollux | W. | 33 3 53 | 3094 | 34 32 10 | 3095 | 36 0 26 | 3095 | 37 28 42 | 3094 |
| | Spica | E. | 57 47 23 | 3105 | 56 19 19 | 3108 | 54 51 19 | 3110 | 53 23 21 | 3112 |
| | Antares | E. | 103 38 45 | 3068 | 102 10 21 | 3090 | 100 41 59 | 3091 | 99 13 38 | 3091 |
| 19 | Sun | W. | 127 27 41 | 3459 | 128 48 51 | 3458 | 130 10 2 | 3458 | 131 31 15 | 3454 |
| | Aldebaran | W. | 89 1 21 | 3098 | 90 29 33 | 3096 | 91 57 47 | 3095 | 93 26 3 | 3092 |
| | Pollux | W. | 44 50 17 | 3088 | 46 18 41 | 3086 | 47 47 8 | 3084 | 49 15 37 | 3081 |
| | Spica | E. | 46 4 4 | 3119 | 44 36 17 | 3119 | 43 8 30 | 3119 | 41 40 44 | 3190 |
| | Antares | E. | 91 51 58 | 3090 | 90 23 36 | 3087 | 88 55 11 | 3086 | 87 26 44 | 3083 |
| 20 | Aldebaran | W. | 100 48 12 | 3077 | 102 16 50 | 3073 | 103 45 32 | 3069 | 105 14 20 | 3065 |
| | Pollux | W. | 56 39 2 | 3083 | 58 7 57 | 3059 | 59 36 57 | 3054 | 61 6 3 | 3048 |
| | Regulus | W. | 20 49 42 | 3163 | 22 16 35 | 3147 | 23 43 48 | 3139 | 25 11 19 | 3118 |
| | Spica | E. | 34 22 4 | 3124 | 32 54 23 | 3125 | 31 26 44 | 3127 | 29 59 7 | 3129 |
| | Antares | E. | 80 3 41 | 3068 | 78 34 52 | 3064 | 77 5 58 | 3059 | 75 36 58 | 3055 |
| 21 | Pollux | W. | 68 33 12 | 3090 | 70 3 0 | 3014 | 71 32 55 | 3008 | 73 2 58 | 3001 |
| | Regulus | W. | 32 32 41 | 3089 | 34 1 37 | 3059 | 35 30 45 | 3043 | 37 0 5 | 3033 |
| | SATURN | W. | 20 2 34 | 3049 | 21 31 46 | 3037 | 23 1 13 | 3026 | 24 30 54 | 3015 |
| | Antares | E. | 68 10 30 | 3029 | 66 40 53 | 3022 | 65 11 8 | 3016 | 63 41 15 | 3010 |
| 22 | Pollux | W. | 80 35 25 | 2965 | 82 6 22 | 2958 | 83 37 28 | 2949 | 85 8 45 | 2942 |
| | Regulus | W. | 44 29 36 | 2988 | 46 0 4 | 2978 | 47 30 44 | 2969 | 49 1 35 | 2961 |
| | SATURN | W. | 32 2 26 | 2968 | 33 33 19 | 2958 | 35 4 24 | 2950 | 36 35 40 | 2940 |
| | Antares | E. | 56 9 54 | 2977 | 54 39 13 | 2970 | 53 8 23 | 2963 | 51 37 24 | 2956 |
| | α Aquilæ | E. | 103 6 11 | 2793 | 101 51 2 | 2777 | 100 35 36 | 2761 | 99 19 53 | 2746 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|----|-------------|----------------|-------------|----------------|------------|----------------|-------------|----------------|
| 14 | SUN | W. | 77° 53' 33" | 3211 | 79° 19' 29" | 3296 | 80° 45' 7" | 3341 | 82° 10' 28" | 3355 |
| | Aldebaran | W. | 35 21 50 | 2909 | 36 53 57 | 2919 | 38 25 52 | 2998 | 39 57 35 | 2999 |
| | Regulus | E. | 45 44 57 | 2876 | 44 12 8 | 2893 | 42 39 40 | 2908 | 41 7 31 | 2923 |
| | SATURN | E. | 58 18 4 | 2840 | 56 44 28 | 2855 | 55 11 11 | 2869 | 53 38 12 | 2889 |
| | Spica | E. | 99 48 5 | 2869 | 98 15 7 | 2883 | 96 42 26 | 2897 | 95 10 3 | 2909 |
| 15 | SUN | W. | 89 13 14 | 3319 | 90 37 3 | 3331 | 92 0 39 | 3341 | 93 24 3 | 3352 |
| | Aldebaran | W. | 47 33 3 | 2986 | 49 3 33 | 2995 | 50 33 52 | 3004 | 52 4 0 | 3012 |
| | Regulus | E. | 33 31 32 | 2998 | 32 1 17 | 3013 | 30 31 20 | 3028 | 29 1 42 | 3044 |
| | SATURN | E. | 45 57 26 | 2944 | 44 26 3 | 2956 | 42 54 55 | 2967 | 41 24 1 | 2977 |
| | Spica | E. | 87 32 6 | 2969 | 86 1 15 | 2980 | 84 30 37 | 2990 | 83 0 12 | 3001 |
| 16 | SUN | W. | 100 18 9 | 3396 | 101 40 28 | 3406 | 103 2 38 | 3412 | 104 24 41 | 3419 |
| | Aldebaran | W. | 59 32 12 | 3049 | 61 1 24 | 3055 | 62 30 29 | 3061 | 63 59 26 | 3067 |
| | Regulus | E. | 21 38 41 | 3137 | 20 11 16 | 3152 | 18 44 21 | 3160 | 17 18 0 | 3225 |
| | SATURN | E. | 33 52 41 | 3096 | 32 23 0 | 3034 | 30 53 30 | 3043 | 29 24 11 | 3052 |
| | Spica | E. | 75 31 4 | 3043 | 74 1 45 | 3051 | 72 32 35 | 3058 | 71 3 34 | 3065 |
| 17 | SUN | W. | 111 13 12 | 3445 | 112 34 38 | 3448 | 113 56 0 | 3451 | 115 17 19 | 3455 |
| | Aldebaran | W. | 71 22 42 | 3087 | 72 51 7 | 3091 | 74 19 28 | 3094 | 75 47 45 | 3096 |
| | Pollux | W. | 27 10 38 | 3091 | 28 38 58 | 3099 | 30 7 17 | 3093 | 31 35 35 | 3093 |
| | Spica | E. | 63 40 18 | 3091 | 62 11 57 | 3095 | 60 43 41 | 3099 | 59 15 30 | 3102 |
| | Antares | E. | 109 32 48 | 3078 | 108 4 12 | 3089 | 106 35 40 | 3084 | 105 7 11 | 3087 |
| 18 | SUN | W. | 122 3 12 | 3489 | 123 24 19 | 3489 | 124 45 26 | 3489 | 126 6 33 | 3481 |
| | Aldebaran | W. | 83 8 43 | 3101 | 84 36 52 | 3101 | 86 5 1 | 3100 | 87 33 11 | 3100 |
| | Pollux | W. | 38 56 59 | 3094 | 40 25 16 | 3092 | 41 53 35 | 3091 | 43 21 55 | 3090 |
| | Spica | E. | 51 55 26 | 3114 | 50 27 33 | 3115 | 48 59 42 | 3116 | 47 31 52 | 3118 |
| | Antares | E. | 97 45 18 | 3091 | 96 16 58 | 3092 | 94 48 39 | 3091 | 93 20 19 | 3091 |
| 19 | SUN | W. | 132 52 30 | 3459 | 134 13 48 | 3448 | 135 35 10 | 3446 | 136 56 35 | 3443 |
| | Aldebaran | W. | 94 54 22 | 3090 | 96 22 44 | 3087 | 97 51 9 | 3084 | 99 19 38 | 3080 |
| | Pollux | W. | 50 44 10 | 3078 | 52 12 46 | 3074 | 53 41 27 | 3071 | 55 10 12 | 3067 |
| | Spica | E. | 40 12 59 | 3190 | 38 45 14 | 3191 | 37 17 30 | 3191 | 35 49 46 | 3193 |
| | Antares | E. | 85 58 14 | 3081 | 84 29 41 | 3078 | 83 1 5 | 3075 | 81 32 25 | 3073 |
| 20 | Aldebaran | W. | 106 43 13 | 3060 | 108 12 11 | 3055 | 109 41 16 | 3050 | 111 10 27 | 3044 |
| | Pollux | W. | 62 35 16 | 3043 | 64 4 35 | 3039 | 65 34 0 | 3033 | 67 3 32 | 3026 |
| | Regulus | W. | 26 39 7 | 3105 | 28 7 10 | 3094 | 29 35 27 | 3083 | 31 3 57 | 3073 |
| | Spica | E. | 28 31 33 | 3133 | 27 4 4 | 3138 | 25 36 41 | 3148 | 24 9 27 | 3156 |
| | Antares | E. | 74 7 53 | 3050 | 72 38 42 | 3044 | 71 9 24 | 3039 | 69 40 0 | 3034 |
| 21 | Pollux | W. | 74 33 10 | 2994 | 76 3 30 | 2987 | 77 33 59 | 2980 | 79 4 37 | 2972 |
| | Regulus | W. | 38 29 37 | 2994 | 39 59 20 | 2915 | 41 29 14 | 2906 | 42 59 19 | 2997 |
| | SATURN | W. | 26 0 48 | 3005 | 27 30 54 | 2995 | 29 1 13 | 2985 | 30 31 44 | 2977 |
| | Antares | E. | 62 11 15 | 3004 | 60 41 7 | 2997 | 59 10 51 | 2991 | 57 40 27 | 2984 |
| 22 | Pollux | W. | 86 40 11 | 2934 | 88 11 47 | 2925 | 89 43 34 | 2917 | 91 15 31 | 2909 |
| | Regulus | W. | 50 32 37 | 2959 | 52 3 50 | 2942 | 53 35 15 | 2934 | 55 6 51 | 2924 |
| | SATURN | W. | 38 7 8 | 2931 | 39 38 47 | 2923 | 41 10 37 | 2913 | 42 42 39 | 2905 |
| | Antares | E. | 50 6 16 | 2950 | 48 35 0 | 2942 | 47 3 35 | 2935 | 45 32 1 | 2928 |
| | α Aquilæ | E. | 98 3 55 | 2722 | 96 47 42 | 2719 | 95 31 15 | 2707 | 94 14 35 | 2695 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|----|-------------|----------------|-------------|----------------|-------------|----------------|------------|----------------|
| 23 | Pollux | W. | 92° 47' 38" | 2901 | 94° 19' 56" | 2902 | 95° 52' 25" | 2904 | 97° 25' 4" | 2976 |
| | Regulus | W. | 56 38 39 | 2916 | 58 10 38 | 2906 | 59 42 49 | 2898 | 61 15 11 | 2889 |
| | SATURN | W. | 44 14 52 | 2896 | 45 47 16 | 2887 | 47 19 52 | 2878 | 48 52 39 | 2869 |
| | Antares | E. | 44 0 18 | 2921 | 42 28 26 | 2915 | 40 56 26 | 2908 | 39 24 17 | 2901 |
| | α Aquilæ | E. | 92 57 43 | 3685 | 91 40 40 | 3675 | 90 23 26 | 3667 | 89 6 4 | 3659 |
| 24 | Pollux | W. | 105 11 4 | 2833 | 106 44 49 | 2824 | 108 18 46 | 2815 | 109 52 54 | 2807 |
| | Regulus | W. | 68 59 54 | 2843 | 70 33 26 | 2835 | 72 7 9 | 2825 | 73 41 4 | 2816 |
| | SATURN | W. | 56 39 26 | 2925 | 58 13 22 | 2915 | 59 47 30 | 2907 | 61 21 49 | 2898 |
| | Antares | E. | 31 41 35 | 2873 | 30 8 42 | 2869 | 28 35 44 | 2866 | 27 2 41 | 2863 |
| | α Aquilæ | E. | 82 37 27 | 3635 | 81 19 30 | 3633 | 80 1 31 | 3632 | 78 43 31 | 3632 |
| | Fomalhaut | E. | 114 10 18 | 3030 | 112 40 43 | 3017 | 111 10 51 | 3004 | 109 40 43 | 2991 |
| 25 | Regulus | W. | 81 33 36 | 2771 | 83 8 42 | 2763 | 84 43 59 | 2753 | 86 19 28 | 2744 |
| | SATURN | W. | 69 16 21 | 2753 | 70 51 50 | 2744 | 72 27 31 | 2735 | 74 3 24 | 2727 |
| | Spica | W. | 27 46 13 | 2848 | 29 19 38 | 2831 | 30 53 25 | 2815 | 32 27 33 | 2801 |
| | α Aquilæ | E. | 72 14 4 | 3654 | 70 56 28 | 3663 | 69 39 1 | 3673 | 68 21 45 | 3685 |
| | Fomalhaut | E. | 102 6 15 | 2933 | 100 34 38 | 2923 | 99 2 48 | 2912 | 97 30 45 | 2902 |
| 26 | Regulus | W. | 94 19 49 | 2701 | 95 56 27 | 2692 | 97 33 17 | 2684 | 99 10 19 | 2675 |
| | SATURN | W. | 82 5 42 | 2683 | 83 42 45 | 2675 | 85 19 59 | 2666 | 86 57 25 | 2657 |
| | Spica | W. | 40 22 51 | 2735 | 41 58 45 | 2722 | 43 34 55 | 2711 | 45 11 20 | 2701 |
| | α Aquilæ | E. | 61 59 27 | 3780 | 60 44 4 | 3807 | 59 29 9 | 3837 | 58 14 45 | 3871 |
| | Fomalhaut | E. | 89 47 22 | 2855 | 88 14 6 | 2848 | 86 40 40 | 2839 | 85 7 3 | 2831 |
| | α Pegasi | E. | 108 5 8 | 3137 | 106 37 43 | 3120 | 105 9 58 | 3105 | 103 41 55 | 3090 |
| 27 | SATURN | W. | 95 7 29 | 2614 | 96 46 5 | 2606 | 98 24 52 | 2597 | 100 3 51 | 2588 |
| | Spica | W. | 53 16 59 | 2649 | 54 54 48 | 2638 | 56 32 51 | 2629 | 58 11 7 | 2618 |
| | α Aquilæ | E. | 52 12 39 | 4106 | 51 2 43 | 4168 | 49 53 47 | 4239 | 48 45 58 | 4318 |
| | Fomalhaut | E. | 77 16 32 | 2796 | 75 41 59 | 2790 | 74 7 18 | 2785 | 72 32 30 | 2779 |
| | α Pegasi | E. | 96 17 24 | 3027 | 94 47 45 | 3017 | 93 17 53 | 3006 | 91 47 48 | 2997 |
| | SUN | E. | 141 17 54 | 2961 | 139 46 52 | 2950 | 138 15 37 | 2941 | 136 44 10 | 2931 |
| 28 | Spica | W. | 66 25 45 | 2572 | 68 5 19 | 2562 | 69 45 6 | 2553 | 71 25 6 | 2543 |
| | Antares | W. | 20 40 18 | 2640 | 22 18 19 | 2618 | 23 56 49 | 2599 | 25 35 45 | 2583 |
| | Fomalhaut | E. | 64 36 55 | 2760 | 63 1 34 | 2756 | 61 26 9 | 2755 | 59 50 42 | 2754 |
| | α Pegasi | E. | 84 14 44 | 2960 | 82 43 41 | 2954 | 81 12 30 | 2949 | 79 41 13 | 2945 |
| | VENUS | E. | 92 22 39 | 2957 | 90 51 32 | 2947 | 89 20 13 | 2937 | 87 48 41 | 2927 |
| | SUN | E. | 129 3 43 | 2981 | 127 31 0 | 2871 | 125 58 4 | 2862 | 124 24 56 | 2852 |
| 29 | Spica | W. | 79 48 17 | 2498 | 81 29 33 | 2489 | 83 11 1 | 2480 | 84 52 42 | 2471 |
| | Antares | W. | 33 55 38 | 2515 | 35 36 31 | 2503 | 37 17 40 | 2491 | 38 59 6 | 2480 |
| | Fomalhaut | E. | 51 53 33 | 2764 | 50 18 18 | 2769 | 48 43 10 | 2777 | 47 8 12 | 2786 |
| | α Pegasi | E. | 72 3 49 | 2935 | 70 32 15 | 2937 | 69 0 43 | 2939 | 67 29 13 | 2942 |
| | VENUS | E. | 80 8 0 | 2880 | 78 35 15 | 2869 | 77 2 17 | 2860 | 75 29 7 | 2851 |
| | SUN | E. | 116 36 6 | 2803 | 115 1 42 | 2794 | 113 27 6 | 2784 | 111 52 17 | 2774 |
| 30 | Spica | W. | 93 24 15 | 2427 | 95 7 11 | 2419 | 96 50 19 | 2410 | 98 33 40 | 2401 |
| | Antares | W. | 47 30 2 | 2428 | 49 12 57 | 2418 | 50 56 6 | 2408 | 52 39 29 | 2399 |
| | α Pegasi | E. | 59 53 18 | 2979 | 58 22 39 | 2993 | 56 52 17 | 3008 | 55 22 14 | 3025 |
| | VENUS | E. | 67 40 12 | 2803 | 66 5 48 | 2794 | 64 31 12 | 2784 | 62 56 23 | 2774 |
| | SUN | E. | 103 55 0 | 2725 | 102 18 54 | 2716 | 100 42 36 | 2707 | 99 6 5 | 2697 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIb. | P. L. of Diff. | XXIb. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|--------------|----------------|------------|----------------|--------------|----------------|
| 23 | Pollux W. | 98° 57' 54" | 2867 | 100° 30' 55" | 2859 | 102° 4' 7" | 2850 | 103° 37' 30" | 2842 |
| | Regulus W. | 62 47 44 | 2880 | 64 20 29 | 2870 | 65 53 26 | 2862 | 67 26 34 | 2852 |
| | SATURN W. | 50 25 37 | 2880 | 51 58 47 | 2852 | 53 32 8 | 2842 | 55 5 41 | 2833 |
| | Antares E. | 37 52 0 | 2895 | 36 19 35 | 2889 | 34 47 2 | 2883 | 33 14 22 | 2878 |
| | α Aquilæ E. | 87 48 33 | 2852 | 86 30 55 | 2847 | 85 13 11 | 2841 | 83 55 21 | 2837 |
| 24 | Pollux W. | 111 27 13 | 2798 | 113 1 43 | 2789 | 114 36 25 | 2781 | 116 11 18 | 2772 |
| | Regulus W. | 75 15 11 | 2807 | 76 49 30 | 2796 | 78 24 0 | 2789 | 79 58 42 | 2780 |
| | SATURN W. | 62 56 20 | 2788 | 64 31 3 | 2780 | 66 5 57 | 2771 | 67 41 3 | 2762 |
| | Antares E. | 25 29 35 | 2862 | 23 56 28 | 2862 | 22 23 21 | 2866 | 20 50 18 | 2871 |
| | α Aquilæ E. | 77 25 31 | 2634 | 76 7 33 | 2636 | 74 49 38 | 2641 | 73 31 48 | 2647 |
| | Fomalhaut E. | 108 10 19 | 2979 | 106 39 40 | 2967 | 105 8 46 | 2956 | 103 37 38 | 2944 |
| 25 | Regulus W. | 87 55 9 | 2735 | 89 31 2 | 2727 | 91 7 6 | 2718 | 92 43 22 | 2710 |
| | SATURN W. | 75 39 28 | 2718 | 77 15 44 | 2709 | 78 52 12 | 2701 | 80 28 51 | 2692 |
| | Spica W. | 34 2 0 | 2786 | 35 36 46 | 2772 | 37 11 51 | 2759 | 38 47 13 | 2747 |
| | α Aquilæ E. | 67 4 42 | 2700 | 65 47 55 | 2716 | 64 31 25 | 2735 | 63 15 15 | 2756 |
| | Fomalhaut E. | 95 58 29 | 2692 | 94 26 0 | 2683 | 92 53 19 | 2673 | 91 20 26 | 2665 |
| 26 | Regulus W. | 100 47 33 | 2666 | 102 24 58 | 2658 | 104 2 34 | 2649 | 105 40 22 | 2641 |
| | SATURN W. | 88 35 2 | 2649 | 90 12 51 | 2640 | 91 50 52 | 2631 | 93 29 5 | 2623 |
| | Spica W. | 46 47 59 | 2689 | 48 24 53 | 2679 | 50 2 1 | 2669 | 51 39 23 | 2658 |
| | α Aquilæ E. | 57 0 56 | 2909 | 55 47 45 | 2949 | 54 35 15 | 2996 | 53 23 31 | 4048 |
| | Fomalhaut E. | 83 33 16 | 2824 | 81 59 19 | 2816 | 80 25 12 | 2809 | 78 50 56 | 2803 |
| | α Pegasi E. | 102 13 33 | 2076 | 100 44 54 | 2063 | 99 15 59 | 2051 | 97 46 49 | 2039 |
| 27 | SATURN W. | 101 43 2 | 2580 | 103 22 25 | 2572 | 105 1 59 | 2563 | 106 41 45 | 2554 |
| | Spica W. | 59 49 37 | 2610 | 61 28 19 | 2599 | 63 7 15 | 2590 | 64 46 24 | 2581 |
| | α Aquilæ E. | 47 39 22 | 2405 | 46 34 5 | 2402 | 45 30 15 | 2411 | 44 28 0 | 2433 |
| | Fomalhaut E. | 70 57 35 | 2775 | 69 22 34 | 2769 | 67 47 26 | 2766 | 66 12 13 | 2762 |
| | α Pegasi E. | 90 17 32 | 2989 | 88 47 5 | 2980 | 87 16 27 | 2973 | 85 45 40 | 2965 |
| | SUN E. | 135 12 30 | 2920 | 133 40 37 | 2911 | 132 8 32 | 2901 | 130 36 14 | 2891 |
| 28 | Spica W. | 73 5 19 | 2534 | 74 45 45 | 2525 | 76 26 23 | 2516 | 78 7 14 | 2507 |
| | Antares W. | 27 15 4 | 2567 | 28 54 44 | 2553 | 30 34 44 | 2540 | 32 15 2 | 2527 |
| | Fomalhaut E. | 58 15 14 | 2754 | 56 39 46 | 2755 | 55 4 19 | 2756 | 53 28 54 | 2760 |
| | α Pegasi E. | 78 9 51 | 2942 | 76 38 25 | 2939 | 75 6 55 | 2937 | 73 35 23 | 2935 |
| | VENUS E. | 86 16 57 | 2918 | 84 45 1 | 2909 | 83 12 53 | 2899 | 81 40 33 | 2889 |
| | SUN E. | 122 51 35 | 2842 | 121 18 2 | 2832 | 119 44 16 | 2822 | 118 10 17 | 2813 |
| 29 | Spica W. | 86 34 36 | 2462 | 88 16 42 | 2453 | 89 59 1 | 2445 | 91 41 32 | 2436 |
| | Antares W. | 40 40 47 | 2470 | 42 22 43 | 2458 | 44 4 55 | 2448 | 45 47 21 | 2438 |
| | Fomalhaut E. | 45 33 26 | 2798 | 43 58 55 | 2811 | 42 24 41 | 2826 | 40 50 50 | 2849 |
| | α Pegasi E. | 65 57 47 | 2946 | 64 26 27 | 2952 | 62 55 14 | 2959 | 61 24 10 | 2969 |
| | VENUS E. | 73 55 45 | 2841 | 72 22 10 | 2831 | 70 48 23 | 2822 | 69 14 24 | 2812 |
| | SUN E. | 110 17 15 | 2764 | 108 42 0 | 2755 | 107 6 33 | 2745 | 105 30 53 | 2735 |
| 30 | Spica W. | 100 17 13 | 2333 | 102 0 58 | 2324 | 103 44 55 | 2316 | 105 29 4 | 2308 |
| | Antares W. | 54 23 5 | 2389 | 56 6 55 | 2380 | 57 50 59 | 2371 | 59 35 16 | 2361 |
| | α Pegasi E. | 53 52 32 | 2046 | 52 23 16 | 2070 | 50 54 30 | 2097 | 49 26 17 | 2129 |
| | VENUS E. | 61 21 21 | 2765 | 59 46 7 | 2756 | 58 10 41 | 2747 | 56 35 3 | 2737 |
| | SUN E. | 97 29 21 | 2687 | 95 52 24 | 2678 | 94 15 15 | 2669 | 92 37 54 | 2660 |

AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | Sideral Time of Semi-diameter Passing Meridian. | Equation of Time, to be Subtracted from Apparent Time. | Diff. for 1 Hour. |
|------------------|-------------------|---|-------------------|-----------------------|-------------------|----------------|---|--|-------------------|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | Semi-diameter. | | | |
| Frid. | 1 | 2 ^h 33 ^m 31.03 ^s | 9.541 | N.15° 4' 33".4 | +45.38 | 15' 54".28 | 66.06 | 2 58.98 | 0.315 |
| Sat. | 2 | 2 37 20.31 | 9.565 | 15 22 35.1 | 44.76 | 15 54.04 | 66.14 | 3 6.24 | 0.291 |
| SUN. | 3 | 2 41 10.14 | 9.588 | 15 40 21.7 | 44.12 | 15 53.80 | 66.22 | 3 12.95 | 0.268 |
| Mon. | 4 | 2 45 05.4 | 9.612 | 15 57 52.9 | +43.47 | 15 53.56 | 66.30 | 3 19.09 | 0.244 |
| Tues. | 5 | 2 48 51.51 | 9.635 | 16 15 8.3 | 42.81 | 15 53.33 | 66.38 | 3 24.66 | 0.221 |
| Wed. | 6 | 2 52 43.06 | 9.659 | 16 32 7.6 | 42.13 | 15 53.10 | 66.46 | 3 29.65 | 0.197 |
| Thur. | 7 | 2 56 35.18 | 9.684 | 16 48 50.5 | +41.44 | 15 52.88 | 66.54 | 3 34.07 | 0.173 |
| Frid. | 8 | 3 0 27.88 | 9.708 | 17 5 16.7 | 40.74 | 15 52.66 | 66.62 | 3 37.92 | 0.149 |
| Sat. | 9 | 3 4 21.15 | 9.732 | 17 21 25.9 | 40.02 | 15 52.44 | 66.70 | 3 41.20 | 0.125 |
| SUN. | 10 | 3 8 14.99 | 9.756 | 17 37 17.6 | +39.29 | 15 52.23 | 66.78 | 3 43.90 | 0.101 |
| Mon. | 11 | 3 12 9.40 | 9.780 | 17 52 51.6 | 38.55 | 15 52.02 | 66.86 | 3 46.04 | 0.077 |
| Tues. | 12 | 3 16 4.38 | 9.803 | 18 8 7.6 | 37.79 | 15 51.81 | 66.95 | 3 47.62 | 0.054 |
| Wed. | 13 | 3 19 59.93 | 9.826 | 18 23 5.4 | +37.02 | 15 51.61 | 67.03 | 3 48.63 | 0.031 |
| Thur. | 14 | 3 23 56.03 | 9.849 | 18 37 44.6 | 36.24 | 15 51.41 | 67.11 | 3 49.08 | 0.008 |
| Frid. | 15 | 3 27 52.68 | 9.872 | 18 52 4.8 | 35.44 | 15 51.22 | 67.19 | 3 48.99 | 0.015 |
| Sat. | 16 | 3 31 49.88 | 9.895 | 19 6 5.8 | +34.64 | 15 51.03 | 67.28 | 3 48.35 | 0.038 |
| SUN. | 17 | 3 35 47.63 | 9.918 | 19 19 47.3 | 33.83 | 15 50.84 | 67.36 | 3 47.16 | 0.061 |
| Mon. | 18 | 3 39 45.93 | 9.940 | 19 33 9.1 | 33.00 | 15 50.66 | 67.44 | 3 45.42 | 0.083 |
| Tues. | 19 | 3 43 44.77 | 9.963 | 19 46 10.9 | +32.16 | 15 50.48 | 67.52 | 3 43.14 | 0.106 |
| Wed. | 20 | 3 47 44.15 | 9.985 | 19 58 52.6 | 31.31 | 15 50.30 | 67.60 | 3 40.32 | 0.128 |
| Thur. | 21 | 3 51 44.06 | 10.007 | 20 11 13.8 | 30.45 | 15 50.12 | 67.68 | 3 36.98 | 0.150 |
| Frid. | 22 | 3 55 44.50 | 10.030 | 20 23 14.3 | +29.58 | 15 49.95 | 67.75 | 3 33.11 | 0.172 |
| Sat. | 23 | 3 59 45.47 | 10.052 | 20 34 53.9 | 28.70 | 15 49.77 | 67.83 | 3 28.71 | 0.194 |
| SUN. | 24 | 4 3 46.96 | 10.073 | 20 46 12.4 | 27.82 | 15 49.60 | 67.90 | 3 23.79 | 0.216 |
| Mon. | 25 | 4 7 48.97 | 10.095 | 20 57 9.5 | +26.92 | 15 49.43 | 67.97 | 3 18.35 | 0.237 |
| Tues. | 26 | 4 11 51.48 | 10.116 | 21 7 45.1 | 26.02 | 15 49.27 | 68.04 | 3 12.41 | 0.258 |
| Wed. | 27 | 4 15 54.49 | 10.136 | 21 17 58.9 | 25.11 | 15 49.11 | 68.11 | 3 5.97 | 0.278 |
| Thur. | 28 | 4 19 58.00 | 10.156 | 21 27 50.7 | +24.19 | 15 48.95 | 68.17 | 2 59.04 | 0.298 |
| Frid. | 29 | 4 24 1.98 | 10.176 | 21 37 20.3 | 23.26 | 15 48.79 | 68.23 | 2 51.63 | 0.318 |
| Sat. | 30 | 4 28 6.43 | 10.195 | 21 46 27.6 | 22.33 | 15 48.64 | 68.29 | 2 43.76 | 0.337 |
| SUN. | 31 | 4 32 11.33 | 10.213 | 21 55 12.3 | 21.38 | 15 48.49 | 68.35 | 2 35.44 | 0.355 |
| Mon. | 32 | 4 36 16.68 | 10.231 | N.22 3 34.2 | +20.43 | 15 48.35 | 68.41 | 2 26.67 | 0.373 |

NOTE.—The mean time of semidiameter passing may be found by subtracting 0".18 from the sideral time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, to be Added to Mean Time. | Diff. for 1 Hour. | Sidereal Time, or Right Ascension of Mean Sun. |
|------------------|-------------------|--|-------------------|---|-------------------|---|-------------------|--|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | | | |
| | | ^h ^m ^s | ^s | N. [°] ['] ["] | ["] | ^m ^s | ^s | ^h ^m ^s |
| Frid. | 1 | 2 33 31.50 | 9.542 | N. 15° 4' 35.6" | +45.38 | 2 59.00 | 0.315 | 2 36 30.51 |
| Sat. | 2 | 2 37 20.80 | 9.566 | 15 22 37.4 | 44.76 | 3 6.26 | 0.291 | 2 40 27.06 |
| SUN. | 3 | 2 41 10.65 | 9.589 | 15 40 24.0 | 44.12 | 3 12.96 | 0.268 | 2 44 23.61 |
| Mon. | 4 | 2 45 1.07 | 9.613 | 15 57 55.2 | +43.47 | 3 19.10 | 0.244 | 2 48 20.17 |
| Tues. | 5 | 2 48 52.06 | 9.636 | 16 15 10.7 | 42.81 | 3 24.67 | 0.221 | 2 52 16.73 |
| Wed. | 6 | 2 52 43.62 | 9.660 | 16 32 10.1 | 42.13 | 3 29.66 | 0.197 | 2 56 13.28 |
| Thur. | 7 | 2 56 35.76 | 9.684 | 16 48 53.0 | +41.44 | 3 34.08 | 0.173 | 3 0 9.84 |
| Frid. | 8 | 3 0 28.47 | 9.708 | 17 5 19.2 | 40.74 | 3 37.93 | 0.149 | 3 4 6.40 |
| Sat. | 9 | 3 4 21.75 | 9.732 | 17 21 28.4 | 40.02 | 3 41.21 | 0.125 | 3 8 2.96 |
| SUN. | 10 | 3 8 15.60 | 9.756 | 17 37 20.1 | +39.29 | 3 43.91 | 0.101 | 3 11 59.51 |
| Mon. | 11 | 3 12 10.02 | 9.780 | 17 52 54.1 | 38.55 | 3 46.05 | 0.077 | 3 15 56.07 |
| Tues. | 12 | 3 16 5.00 | 9.803 | 18 8 10.1 | 37.79 | 3 47.62 | 0.054 | 3 19 52.62 |
| Wed. | 13 | 3 20 0.55 | 9.826 | 18 23 7.8 | +37.02 | 3 48.63 | 0.031 | 3 23 49.18 |
| Thur. | 14 | 3 23 56.65 | 9.849 | 18 37 46.9 | 36.24 | 3 49.08 | 0.008 | 3 27 45.73 |
| Frid. | 15 | 3 27 53.30 | 9.872 | 18 52 7.0 | 35.44 | 3 48.99 | 0.015 | 3 31 42.29 |
| Sat. | 16 | 3 31 50.50 | 9.895 | 19 6 8.0 | +34.64 | 3 48.35 | 0.038 | 3 35 38.85 |
| SUN. | 17 | 3 35 48.25 | 9.918 | 19 19 49.5 | 33.83 | 3 47.16 | 0.061 | 3 39 35.41 |
| Mon. | 18 | 3 39 46.55 | 9.940 | 19 33 11.2 | 33.00 | 3 45.42 | 0.083 | 3 43 31.97 |
| Tues. | 19 | 3 43 45.39 | 9.963 | 19 46 13.0 | +32.16 | 3 43.13 | 0.106 | 3 47 28.52 |
| Wed. | 20 | 3 47 44.76 | 9.985 | 19 58 54.6 | 31.31 | 3 40.31 | 0.128 | 3 51 25.07 |
| Thur. | 21 | 3 51 44.66 | 10.007 | 20 11 15.7 | 30.45 | 3 36.97 | 0.150 | 3 55 21.63 |
| Frid. | 22 | 3 55 45.09 | 10.029 | 20 23 16.1 | +29.58 | 3 33.10 | 0.172 | 3 59 18.19 |
| Sat. | 23 | 3 59 46.05 | 10.051 | 20 34 55.6 | 28.70 | 3 28.70 | 0.194 | 4 3 14.75 |
| SUN. | 24 | 4 3 47.53 | 10.072 | 20 46 14.0 | 27.82 | 3 23.78 | 0.216 | 4 7 11.31 |
| Mon. | 25 | 4 7 49.52 | 10.094 | 20 57 11.0 | +26.92 | 3 18.34 | 0.237 | 4 11 7.86 |
| Tues. | 26 | 4 11 52.02 | 10.115 | 21 7 46.5 | 26.02 | 3 12.40 | 0.258 | 4 15 4.42 |
| Wed. | 27 | 4 15 55.02 | 10.135 | 21 18 0.2 | 25.11 | 3 5.96 | 0.278 | 4 19 0.98 |
| Thur. | 28 | 4 19 58.51 | 10.155 | 21 27 51.9 | +24.19 | 2 59.02 | 0.298 | 4 22 57.53 |
| Frid. | 29 | 4 24 2.47 | 10.175 | 21 37 21.4 | 23.26 | 2 51.62 | 0.318 | 4 26 54.09 |
| Sat. | 30 | 4 28 6.90 | 10.194 | 21 46 28.6 | 22.33 | 2 43.75 | 0.337 | 4 30 50.65 |
| SUN. | 31 | 4 32 11.78 | 10.212 | 21 55 13.2 | 21.38 | 2 35.43 | 0.355 | 4 34 47.21 |
| Mon. | 32 | 4 36 17.10 | 10.230 | N. 22° 3' 35.0" | +20.43 | 2 26.66 | 0.373 | 4 38 43.76 |

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour,
+9°.8565.
(Table III.)

| AT GREENWICH MEAN NOON. | | | | | | | | |
|---|------------------|-----------------|------------|-------------------|-----------|--|-------------------|--|
| Day of the Month. | Day of the Year. | THE SUN'S | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 Hour. | Mean Time of Sidereal Noon. |
| | | TRUE LONGITUDE. | | Diff. for 1 Hour. | LATITUDE. | | | |
| | | λ | λ' | | | | | |
| 1 | 121 | 40° 48' 45.8 | 48' 46.2 | 145.47 | — 0.39 | 0.0034983 | +46.2 | ^h 21 ^m 19 ^s 59.23 |
| 2 | 122 | 41 46 56.3 | 46 56.6 | 145.41 | 0.43 | 0.0036088 | 45.8 | 21 16 3.32 |
| 3 | 123 | 42 45 5.4 | 45 5.6 | 145.34 | 0.44 | 0.0037179 | 45.2 | 21 12 7.40 |
| 4 | 124 | 43 43 13.0 | 43 13.0 | 145.28 | — 0.42 | 0.0038256 | +44.6 | 21 8 11.49 |
| 5 | 125 | 44 41 19.1 | 41 18.9 | 145.22 | 0.37 | 0.0039318 | 43.9 | 21 4 15.58 |
| 6 | 126 | 45 39 23.7 | 39 23.4 | 145.16 | 0.29 | 0.0040363 | 43.2 | 21 0 19.67 |
| 7 | 127 | 46 37 26.8 | 37 26.4 | 145.10 | — 0.19 | 0.0041391 | +42.5 | 20 56 23.76 |
| 8 | 128 | 47 35 28.4 | 35 27.8 | 145.03 | — 0.07 | 0.0042401 | 41.7 | 20 52 27.85 |
| 9 | 129 | 48 33 28.4 | 33 27.6 | 144.97 | + 0.06 | 0.0043391 | 40.9 | 20 48 31.94 |
| 10 | 130 | 49 31 26.7 | 31 25.7 | 144.90 | + 0.20 | 0.0044362 | +40.1 | 20 44 36.03 |
| 11 | 131 | 50 29 23.3 | 29 22.2 | 144.83 | 0.33 | 0.0045315 | 39.3 | 20 40 40.12 |
| 12 | 132 | 51 27 18.3 | 27 17.1 | 144.76 | 0.46 | 0.0046251 | 38.6 | 20 36 44.21 |
| 13 | 133 | 52 25 11.6 | 25 10.3 | 144.69 | + 0.56 | 0.0047169 | +37.9 | 20 32 48.30 |
| 14 | 134 | 53 23 3.1 | 23 1.6 | 144.61 | 0.64 | 0.0048068 | 37.2 | 20 28 52.39 |
| 15 | 135 | 54 20 52.8 | 20 51.1 | 144.54 | 0.69 | 0.0048950 | 36.5 | 20 24 56.48 |
| 16 | 136 | 55 18 40.8 | 18 39.0 | 144.46 | + 0.71 | 0.0049817 | +35.9 | 20 21 0.57 |
| 17 | 137 | 56 16 27.1 | 16 25.2 | 144.39 | 0.71 | 0.0050671 | 35.4 | 20 17 4.66 |
| 18 | 138 | 57 14 11.8 | 14 9.7 | 144.33 | 0.68 | 0.0051513 | 34.9 | 20 13 8.75 |
| 19 | 139 | 58 11 54.8 | 11 52.5 | 144.26 | + 0.62 | 0.0052344 | +34.4 | 20 9 12.84 |
| 20 | 140 | 59 9 36.3 | 9 33.8 | 144.20 | 0.53 | 0.0053163 | 33.9 | 20 5 16.93 |
| 21 | 141 | 60 7 16.3 | 7 13.7 | 144.14 | 0.42 | 0.0053971 | 33.4 | 20 1 21.02 |
| 22 | 142 | 61 4 54.9 | 4 52.2 | 144.08 | + 0.29 | 0.0054768 | +33.0 | 19 57 25.11 |
| 23 | 143 | 62 2 32.2 | 2 29.3 | 144.03 | 0.16 | 0.0055555 | 32.6 | 19 53 29.19 |
| 24 | 144 | 63 0 8.3 | 0 5.2 | 143.98 | + 0.03 | 0.0056332 | 32.2 | 19 49 33.28 |
| 25 | 145 | 63 57 43.2 | 57 40.0 | 143.94 | — 0.10 | 0.0057099 | +31.7 | 19 45 37.37 |
| 26 | 146 | 64 55 17.1 | 55 13.7 | 143.90 | 0.21 | 0.0057854 | 31.2 | 19 41 41.46 |
| 27 | 147 | 65 52 50.0 | 52 46.4 | 143.86 | 0.30 | 0.0058598 | 30.7 | 19 37 45.55 |
| 28 | 148 | 66 50 21.9 | 50 18.1 | 143.82 | — 0.37 | 0.0059329 | +30.2 | 19 33 49.64 |
| 29 | 149 | 67 47 53.0 | 47 49.0 | 143.78 | 0.41 | 0.0060045 | 29.5 | 19 29 53.73 |
| 30 | 150 | 68 45 23.3 | 45 19.1 | 143.75 | 0.42 | 0.0060744 | 28.8 | 19 25 57.82 |
| 31 | 151 | 69 42 52.9 | 42 48.5 | 143.71 | 0.40 | 0.0061427 | 28.0 | 19 22 1.91 |
| 32 | 152 | 70 40 21.7 | 40 17.2 | 143.68 | — 0.35 | 0.0062091 | +27.2 | 19 18 6.01 |
| NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 th . | | | | | | | | |
| Diff. for 1 Hour. — 9 ^h 52 ^m 36 ^s . (Table II.) | | | | | | | | |

GREENWICH MEAN TIME.

THE MOON'S

| Day of the Month. | SEMI-DIAMETER. | | HORIZONTAL PARALLAX. | | | | UPPER TRANSIT. | | AGE. |
|-------------------|----------------|-----------|----------------------|-------------------|-----------|-------------------|---------------------------|-------------------|--------------|
| | Noon. | Midnight. | Noon. | Diff. for 1 Hour. | Midnight. | Diff. for 1 Hour. | Meridian of Greenwich. | Diff. for 1 Hour. | Noon. |
| | | | | | | | ^h ^m | ^m | ^d |
| 1 | 16' 5.3 | 16' 9.0 | 58' 56.1 | +1.17 | 59' 9.6 | +1.10 | 19 0.8 | 2.30 | 22.6 |
| 2 | 16 12.4 | 16 15.5 | 59 22.2 | 1.01 | 59 33.7 | 0.89 | 19 54.8 | 2.21 | 23.6 |
| 3 | 16 18.2 | 16 20.3 | 59 43.5 | 0.74 | 59 51.4 | 0.58 | 20 46.7 | 2.14 | 24.6 |
| 4 | 16 21.9 | 16 22.8 | 59 57.2 | +0.39 | 60 0.5 | +0.17 | 21 37.3 | 2.10 | 25.6 |
| 5 | 16 23.0 | 16 22.3 | 60 1.1 | -0.08 | 59 58.7 | -0.34 | 22 27.5 | 2.11 | 26.6 |
| 6 | 16 20.8 | 16 18.5 | 59 53.2 | 0.59 | 59 44.6 | 0.84 | 23 18.5 | 2.15 | 27.6 |
| 7 | 16 15.3 | 16 11.4 | 59 33.0 | -1.09 | 59 18.6 | -1.32 | ♄ | | 28.6 |
| 8 | 16 6.8 | 16 1.5 | 59 1.5 | 1.52 | 58 42.2 | 1.69 | 0 10.9 | 2.22 | 0.2 |
| 9 | 15 55.8 | 15 49.6 | 58 21.1 | 1.82 | 57 58.6 | 1.91 | 1 5.2 | 2.29 | 1.2 |
| 10 | 15 43.3 | 15 36.8 | 57 35.2 | -1.97 | 57 11.4 | -1.98 | 2 1.0 | 2.33 | 2.2 |
| 11 | 15 30.4 | 15 24.1 | 56 47.8 | 1.94 | 56 24.7 | 1.89 | 2 57.1 | 2.32 | 3.2 |
| 12 | 15 18.0 | 15 12.4 | 56 2.5 | 1.80 | 55 41.7 | 1.67 | 3 52.1 | 2.24 | 4.2 |
| 13 | 15 7.2 | 15 2.5 | 55 22.6 | -1.51 | 55 5.5 | -1.34 | 4 44.8 | 2.13 | 5.2 |
| 14 | 14 58.4 | 14 55.0 | 54 50.5 | 1.16 | 54 37.9 | 0.96 | 5 34.4 | 2.00 | 6.2 |
| 15 | 14 52.2 | 14 50.1 | 54 27.7 | 0.75 | 54 20.1 | 0.53 | 6 20.8 | 1.87 | 7.2 |
| 16 | 14 48.8 | 14 48.1 | 54 15.1 | -0.32 | 54 12.6 | -0.11 | 7 4.3 | 1.77 | 8.2 |
| 17 | 14 48.2 | 14 48.9 | 54 12.8 | +0.11 | 54 15.4 | +0.32 | 7 45.9 | 1.71 | 9.2 |
| 18 | 14 50.2 | 14 52.2 | 54 20.3 | 0.51 | 54 27.5 | 0.60 | 8 26.5 | 1.69 | 10.2 |
| 19 | 14 54.7 | 14 57.7 | 54 36.8 | +0.86 | 54 47.9 | +1.00 | 9 6.9 | 1.71 | 11.2 |
| 20 | 15 1.2 | 15 5.1 | 55 0.7 | 1.13 | 55 14.9 | 1.24 | 9 48.4 | 1.77 | 12.2 |
| 21 | 15 9.3 | 15 13.7 | 55 30.3 | 1.33 | 55 46.6 | 1.39 | 10 31.9 | 1.87 | 13.2 |
| 22 | 15 18.3 | 15 23.0 | 56 3.5 | +1.42 | 56 20.8 | +1.45 | 11 18.4 | 2.02 | 14.2 |
| 23 | 15 27.7 | 15 32.4 | 56 38.1 | 1.45 | 56 55.2 | 1.42 | 12 8.7 | 2.18 | 15.2 |
| 24 | 15 36.9 | 15 41.3 | 57 11.9 | 1.37 | 57 28.0 | 1.31 | 13 3.0 | 2.33 | 16.2 |
| 25 | 15 45.5 | 15 49.4 | 57 43.3 | +1.24 | 57 57.6 | +1.15 | 14 0.7 | 2.44 | 17.2 |
| 26 | 15 53.0 | 15 56.3 | 58 10.9 | 1.07 | 58 23.1 | 0.97 | 15 0.3 | 2.48 | 18.2 |
| 27 | 15 59.3 | 16 2.0 | 58 34.1 | 0.87 | 58 44.0 | 0.78 | 15 59.6 | 2.43 | 19.2 |
| 28 | 16 4.4 | 16 6.4 | 58 52.7 | +0.68 | 59 0.2 | +0.58 | 16 56.8 | 2.32 | 20.2 |
| 29 | 16 8.1 | 16 9.6 | 59 6.6 | 0.49 | 59 11.8 | 0.39 | 17 51.2 | 2.21 | 21.2 |
| 30 | 16 10.7 | 16 11.4 | 59 15.8 | 0.29 | 59 18.7 | +0.19 | 18 42.9 | 2.11 | 22.2 |
| 31 | 16 11.9 | 16 12.0 | 59 20.3 | +0.08 | 59 20.6 | -0.04 | 19 32.5 | 2.05 | 23.2 |
| 32 | 16 11.7 | 16 11.0 | 59 19.5 | -0.16 | 59 16.9 | -0.29 | 20 21.2 | 2.04 | 24.2 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|--|---------------------|------------------|---------------------|-----------|--|---------------------|------------------|---------------------|
| FRIDAY 1. | | | | | SUNDAY 3. | | | | |
| 0 | ^h 20 ^m 54 ^s 25.72 | 2.4510 | S. 22° 20' 45.1" | 8.397 | 0 | ^h 22 ^m 47 ^s 52.81 | 2.3767 | S. 13° 17' 58.0" | 13.826 |
| 1 | 20 56 52.68 | 2.4477 | 22 12 23.0 | 8.440 | 1 | 22 50 9.31 | 2.3734 | 13 4 6.0 | 13.907 |
| 2 | 20 59 19.44 | 2.4443 | 22 3 52.3 | 8.582 | 2 | 22 52 25.62 | 2.3702 | 12 50 9.1 | 13.987 |
| 3 | 21 1 45.99 | 2.4408 | 21 55 13.1 | 8.723 | 3 | 22 54 41.74 | 2.3671 | 12 36 7.5 | 14.066 |
| 4 | 21 4 12.34 | 2.4374 | 21 46 25.5 | 8.863 | 4 | 22 56 57.07 | 2.3640 | 12 22 1.2 | 14.144 |
| 5 | 21 6 38.48 | 2.4340 | 21 37 29.5 | 9.003 | 5 | 22 59 13.42 | 2.3609 | 12 7 50.2 | 14.220 |
| 6 | 21 9 4.42 | 2.4306 | 21 28 25.1 | 9.142 | 6 | 23 1 28.98 | 2.3578 | 11 53 34.8 | 14.294 |
| 7 | 21 11 30.15 | 2.4270 | 21 19 12.5 | 9.278 | 7 | 23 3 44.36 | 2.3549 | 11 39 15.0 | 14.367 |
| 8 | 21 13 55.66 | 2.4234 | 21 9 51.7 | 9.414 | 8 | 23 5 59.57 | 2.3521 | 11 24 50.8 | 14.438 |
| 9 | 21 16 20.95 | 2.4198 | 21 0 22.8 | 9.548 | 9 | 23 8 14.61 | 2.3492 | 11 10 22.4 | 14.508 |
| 10 | 21 18 46.03 | 2.4162 | 20 50 45.9 | 9.682 | 10 | 23 10 29.48 | 2.3464 | 10 55 49.8 | 14.577 |
| 11 | 21 21 10.89 | 2.4125 | 20 41 0.9 | 9.816 | 11 | 23 12 44.18 | 2.3436 | 10 41 13.2 | 14.643 |
| 12 | 21 23 35.53 | 2.4088 | 20 31 8.0 | 9.947 | 12 | 23 14 58.71 | 2.3408 | 10 26 32.7 | 14.708 |
| 13 | 21 25 59.95 | 2.4051 | 20 21 7.3 | 10.077 | 13 | 23 17 13.08 | 2.3382 | 10 11 48.3 | 14.772 |
| 14 | 21 28 24.14 | 2.4013 | 20 10 58.8 | 10.207 | 14 | 23 19 27.30 | 2.3357 | 9 57 0.1 | 14.833 |
| 15 | 21 30 48.11 | 2.3976 | 20 0 42.5 | 10.335 | 15 | 23 21 41.37 | 2.3332 | 9 42 8.3 | 14.893 |
| 16 | 21 33 11.86 | 2.3939 | 19 50 18.6 | 10.462 | 16 | 23 23 55.29 | 2.3307 | 9 27 12.9 | 14.952 |
| 17 | 21 35 35.38 | 2.3901 | 19 39 47.1 | 10.587 | 17 | 23 26 9.06 | 2.3282 | 9 12 14.0 | 15.010 |
| 18 | 21 37 58.67 | 2.3862 | 19 29 8.1 | 10.712 | 18 | 23 28 22.68 | 2.3258 | 8 57 11.7 | 15.067 |
| 19 | 21 40 21.73 | 2.3824 | 19 18 21.7 | 10.835 | 19 | 23 30 36.16 | 2.3236 | 8 42 6.0 | 15.121 |
| 20 | 21 42 44.56 | 2.3787 | 19 7 27.9 | 10.957 | 20 | 23 32 49.51 | 2.3214 | 8 26 57.2 | 15.173 |
| 21 | 21 45 7.17 | 2.3749 | 18 56 26.9 | 11.077 | 21 | 23 35 2.73 | 2.3192 | 8 11 45.3 | 15.223 |
| 22 | 21 47 29.55 | 2.3711 | 18 45 18.7 | 11.197 | 22 | 23 37 15.82 | 2.3171 | 7 56 30.4 | 15.273 |
| 23 | 21 49 51.70 | 2.3672 | S. 18° 34' 3.3" | 11.315 | 23 | 23 39 28.78 | 2.3150 | S. 7° 41' 12.5" | 15.322 |
| SATURDAY 2. | | | | | MONDAY 4. | | | | |
| 0 | 21 52 13.62 | 2.3634 | S. 18° 22' 40.9" | 11.432 | 0 | 23 41 41.62 | 2.3131 | S. 7° 25' 51.8" | 15.368 |
| 1 | 21 54 35.31 | 2.3596 | 18 11 11.5 | 11.547 | 1 | 23 43 54.35 | 2.3119 | 7 10 28.4 | 15.413 |
| 2 | 21 56 56.78 | 2.3558 | 17 59 35.2 | 11.662 | 2 | 23 46 6.96 | 2.3093 | 6 55 2.3 | 15.456 |
| 3 | 21 59 18.01 | 2.3519 | 17 47 52.1 | 11.775 | 3 | 23 48 19.46 | 2.3075 | 6 39 33.7 | 15.497 |
| 4 | 22 1 39.01 | 2.3482 | 17 36 2.2 | 11.887 | 4 | 23 50 31.86 | 2.3057 | 6 24 2.7 | 15.537 |
| 5 | 22 3 59.79 | 2.3444 | 17 24 5.7 | 11.996 | 5 | 23 52 44.15 | 2.3040 | 6 8 29.3 | 15.576 |
| 6 | 22 6 20.34 | 2.3406 | 17 12 2.7 | 12.104 | 6 | 23 54 56.34 | 2.3024 | 5 52 53.6 | 15.613 |
| 7 | 22 8 40.66 | 2.3368 | 16 59 53.2 | 12.212 | 7 | 23 57 8.44 | 2.3009 | 5 37 15.8 | 15.648 |
| 8 | 22 11 0.76 | 2.3331 | 16 47 37.2 | 12.319 | 8 | 23 59 20.45 | 2.2994 | 5 21 35.9 | 15.681 |
| 9 | 22 13 20.63 | 2.3294 | 16 35 14.9 | 12.424 | 9 | 0 1 32.37 | 2.2980 | 5 5 54.1 | 15.713 |
| 10 | 22 15 40.28 | 2.3257 | 16 22 46.3 | 12.527 | 10 | 0 3 44.21 | 2.2967 | 4 50 10.4 | 15.743 |
| 11 | 22 17 59.71 | 2.3220 | 16 10 11.6 | 12.629 | 11 | 0 5 55.98 | 2.2955 | 4 34 24.9 | 15.772 |
| 12 | 22 20 18.92 | 2.3183 | 15 57 30.8 | 12.730 | 12 | 0 8 7.67 | 2.2943 | 4 18 37.7 | 15.799 |
| 13 | 22 22 37.91 | 2.3147 | 15 44 44.0 | 12.829 | 13 | 0 10 19.29 | 2.2932 | 4 2 49.0 | 15.824 |
| 14 | 22 24 56.68 | 2.3110 | 15 31 51.3 | 12.928 | 14 | 0 12 30.85 | 2.2921 | 3 46 58.8 | 15.848 |
| 15 | 22 27 15.23 | 2.3074 | 15 18 52.7 | 13.025 | 15 | 0 14 42.34 | 2.2910 | 3 31 7.2 | 15.871 |
| 16 | 22 29 33.57 | 2.3039 | 15 5 48.3 | 13.119 | 16 | 0 16 53.77 | 2.2901 | 3 15 14.3 | 15.892 |
| 17 | 22 31 51.70 | 2.3004 | 14 52 38.4 | 13.211 | 17 | 0 19 5.15 | 2.2893 | 2 59 20.2 | 15.910 |
| 18 | 22 34 9.62 | 2.2969 | 14 39 23.0 | 13.303 | 18 | 0 21 16.48 | 2.2885 | 2 43 25.1 | 15.927 |
| 19 | 22 36 27.33 | 2.2934 | 14 26 2.1 | 13.394 | 19 | 0 23 27.77 | 2.2877 | 2 27 29.0 | 15.943 |
| 20 | 22 38 44.83 | 2.2900 | 14 12 35.7 | 13.484 | 20 | 0 25 39.01 | 2.2870 | 2 11 31.9 | 15.957 |
| 21 | 22 41 2.13 | 2.2866 | 13 59 4.0 | 13.572 | 21 | 0 27 50.21 | 2.2864 | 1 55 34.1 | 15.969 |
| 22 | 22 43 19.22 | 2.2832 | 13 45 27.1 | 13.658 | 22 | 0 30 1.38 | 2.2860 | 1 39 35.6 | 15.980 |
| 23 | 22 45 36.11 | 2.2799 | 13 31 45.1 | 13.743 | 23 | 0 32 12.53 | 2.2856 | 1 23 36.5 | 15.990 |
| 24 | 22 47 52.81 | 2.2767 | S. 13° 17' 58.0" | 13.826 | 24 | 0 34 23.65 | 2.2852 | S. 1° 7' 36.8" | 15.998 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|----------------|---------------------|-------------|------------------|---------------------|------------------|---------------------|
| TUESDAY 5. | | | | | THURSDAY 7. | | | | |
| 0 | h m s | s | S. 1° 7' 36.8" | 15.998 | 0 | h m s | s | N. 11° 17' 38.2" | 14.497 |
| 1 | 0 36 34.75 | 2.1852 | 0 51 36.7 | 16.003 | 1 | 2 22 19.75 | 2.9439 | 11 32 1.7 | 14.355 |
| 2 | 0 38 45.83 | 2.1846 | 0 35 36.4 | 16.007 | 2 | 2 24 34.46 | 2.9463 | 11 46 20.8 | 14.281 |
| 3 | 0 40 56.90 | 2.1844 | 0 19 35.9 | 16.009 | 3 | 2 26 49.31 | 2.9489 | 12 0 35.4 | 14.205 |
| 4 | 0 43 7.96 | 2.1843 | S. 0 3 35.3 | 16.011 | 4 | 2 29 4.32 | 2.9515 | 12 14 45.4 | 14.128 |
| 5 | 0 45 19.02 | 2.1842 | N. 0 12 25.4 | 16.011 | 5 | 2 31 19.49 | 2.9541 | 12 28 50.8 | 14.051 |
| 6 | 0 47 30.07 | 2.1842 | 0 28 26.0 | 16.008 | 6 | 2 33 34.81 | 2.9567 | 12 42 51.5 | 13.979 |
| 7 | 0 49 41.13 | 2.1844 | 0 44 26.4 | 16.004 | 7 | 2 35 50.29 | 2.9593 | 12 56 47.4 | 13.890 |
| 8 | 0 51 52.20 | 2.1846 | 1 0 26.5 | 15.998 | 8 | 2 38 5.93 | 2.9620 | 13 10 38.3 | 13.806 |
| 9 | 0 54 3.28 | 2.1848 | 1 16 26.2 | 15.991 | 9 | 2 40 21.73 | 2.9647 | 13 24 24.1 | 13.721 |
| 10 | 0 56 14.37 | 2.1851 | 1 32 25.4 | 15.982 | 10 | 2 42 37.70 | 2.9675 | 13 38 4.8 | 13.636 |
| 11 | 0 58 25.49 | 2.1855 | 1 48 24.0 | 15.971 | 11 | 2 44 53.83 | 2.9703 | 13 51 40.4 | 13.549 |
| 12 | 1 0 36.63 | 2.1859 | 2 4 21.9 | 15.958 | 12 | 2 47 10.13 | 2.9731 | 14 5 10.7 | 13.460 |
| 13 | 1 2 47.80 | 2.1864 | 2 20 19.0 | 15.945 | 13 | 2 49 26.60 | 2.9759 | 14 18 35.6 | 13.369 |
| 14 | 1 4 59.00 | 2.1870 | 2 36 15.3 | 15.930 | 14 | 2 51 43.24 | 2.9787 | 14 31 55.0 | 13.277 |
| 15 | 1 7 10.24 | 2.1876 | 2 52 10.6 | 15.912 | 15 | 2 54 0.04 | 2.9815 | 14 45 8.9 | 13.185 |
| 16 | 1 9 21.51 | 2.1883 | 3 8 4.8 | 15.893 | 16 | 2 56 17.02 | 2.9844 | 14 58 17.2 | 13.091 |
| 17 | 1 11 32.83 | 2.1891 | 3 23 57.8 | 15.872 | 17 | 2 58 34.17 | 2.9873 | 15 11 19.8 | 12.994 |
| 18 | 1 13 44.20 | 2.1899 | 3 39 49.5 | 15.850 | 18 | 3 0 51.49 | 2.9902 | 15 24 16.5 | 12.896 |
| 19 | 1 15 55.62 | 2.1908 | 3 55 39.8 | 15.827 | 19 | 3 3 8.99 | 2.9931 | 15 37 7.3 | 12.797 |
| 20 | 1 18 7.10 | 2.1917 | 4 11 28.7 | 15.809 | 20 | 3 5 26.66 | 2.9960 | 15 49 52.2 | 12.698 |
| 21 | 1 20 18.63 | 2.1928 | 4 27 16.0 | 15.774 | 21 | 3 7 44.51 | 2.9989 | 16 2 31.1 | 12.597 |
| 22 | 1 22 30.23 | 2.1939 | 4 43 1.6 | 15.746 | 22 | 3 10 2.63 | 2.3018 | 16 15 3.8 | 12.493 |
| 23 | 1 24 41.90 | 2.1950 | N. 4 58 45.5 | 15.716 | 23 | 3 12 20.73 | 2.3047 | N. 16 27 30.3 | 12.389 |
| WEDNESDAY 6. | | | | | FRIDAY 8. | | | | |
| 0 | 1 26 53.63 | 2.1962 | N. 5 14 27.5 | 15.683 | 0 | 3 14 39.10 | 2.3077 | N. 16 39 50.5 | 12.283 |
| 1 | 1 29 5.44 | 2.1975 | 5 30 7.5 | 15.649 | 1 | 3 16 57.65 | 2.3107 | 16 52 4.3 | 12.177 |
| 2 | 1 31 17.33 | 2.1988 | 5 45 45.4 | 15.614 | 2 | 3 19 16.38 | 2.3136 | 17 4 11.7 | 12.068 |
| 3 | 1 33 29.29 | 2.2001 | 6 1 21.2 | 15.577 | 3 | 3 21 35.28 | 2.3165 | 17 16 12.5 | 11.958 |
| 4 | 1 35 41.34 | 2.2016 | 6 16 54.7 | 15.538 | 4 | 3 23 54.36 | 2.3194 | 17 28 6.7 | 11.848 |
| 5 | 1 37 53.48 | 2.2032 | 6 32 25.8 | 15.498 | 5 | 3 26 13.61 | 2.3223 | 17 39 54.2 | 11.736 |
| 6 | 1 40 5.72 | 2.2047 | 6 47 54.4 | 15.456 | 6 | 3 28 33.04 | 2.3252 | 17 51 35.0 | 11.623 |
| 7 | 1 42 18.05 | 2.2063 | 7 3 20.5 | 15.413 | 7 | 3 30 52.64 | 2.3282 | 18 3 8.9 | 11.508 |
| 8 | 1 44 30.48 | 2.2079 | 7 18 43.9 | 15.368 | 8 | 3 33 12.42 | 2.3311 | 18 14 35.9 | 11.393 |
| 9 | 1 46 43.00 | 2.2096 | 7 34 4.6 | 15.321 | 9 | 3 35 32.37 | 2.3339 | 18 25 56.0 | 11.276 |
| 10 | 1 48 55.63 | 2.2114 | 7 49 22.4 | 15.273 | 10 | 3 37 52.49 | 2.3367 | 18 37 9.0 | 11.157 |
| 11 | 1 51 8.37 | 2.2133 | 8 4 37.3 | 15.223 | 11 | 3 40 12.78 | 2.3396 | 18 48 14.9 | 11.037 |
| 12 | 1 53 21.23 | 2.2152 | 8 19 49.1 | 15.171 | 12 | 3 42 33.24 | 2.3424 | 18 59 13.5 | 10.917 |
| 13 | 1 55 34.20 | 2.2171 | 8 34 57.8 | 15.118 | 13 | 3 44 53.87 | 2.3452 | 19 10 4.9 | 10.796 |
| 14 | 1 57 47.28 | 2.2190 | 8 50 3.2 | 15.063 | 14 | 3 47 14.67 | 2.3480 | 19 20 49.0 | 10.672 |
| 15 | 2 0 0.48 | 2.2211 | 9 5 5.3 | 15.007 | 15 | 3 49 35.63 | 2.3507 | 19 31 25.6 | 10.548 |
| 16 | 2 2 13.81 | 2.2232 | 9 20 4.0 | 14.948 | 16 | 3 51 56.76 | 2.3535 | 19 41 54.8 | 10.424 |
| 17 | 2 4 27.26 | 2.2253 | 9 34 59.1 | 14.888 | 17 | 3 54 18.05 | 2.3562 | 19 52 16.5 | 10.298 |
| 18 | 2 6 40.84 | 2.2274 | 9 49 50.6 | 14.827 | 18 | 3 56 39.50 | 2.3588 | 20 2 30.6 | 10.171 |
| 19 | 2 8 54.55 | 2.2297 | 10 4 38.4 | 14.765 | 19 | 3 59 1.11 | 2.3614 | 20 12 37.0 | 10.042 |
| 20 | 2 11 8.40 | 2.2320 | 10 19 22.4 | 14.700 | 20 | 4 1 22.87 | 2.3640 | 20 22 35.7 | 9.913 |
| 21 | 2 13 22.39 | 2.2343 | 10 34 2.4 | 14.634 | 21 | 4 3 44.79 | 2.3666 | 20 32 26.6 | 9.783 |
| 22 | 2 15 36.51 | 2.2368 | 10 48 38.4 | 14.567 | 22 | 4 6 6.87 | 2.3692 | 20 42 9.6 | 9.652 |
| 23 | 2 17 50.78 | 2.2390 | 11 3 10.4 | 14.498 | 23 | 4 8 29.09 | 2.3718 | 20 51 44.8 | 9.520 |
| 24 | 2 20 5.19 | 2.2414 | N. 11 17 38.2 | 14.427 | 24 | 4 10 51.46 | 2.3740 | N. 21 1 12.0 | 9.387 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|---------------------|----------------|---------------------|-------------|------------------|---------------------|-----------------|---------------------|
| SATURDAY 9. | | | | | MONDAY 11. | | | | |
| 0 | h m s | s | N. 21° 1' 12.0 | " | 0 | h m s | s | N. 25° 45' 49.2 | " |
| 1 | 4 10 51.46 | 2.3740 | 21 10 31.2 | 9.387 | 1 | 6 6 23.62 | 2.4090 | 25 48 4.4 | 2.329 |
| 2 | 4 13 13.97 | 2.3764 | 21 19 42.3 | 9.253 | 2 | 6 8 48.12 | 2.4076 | 25 50 10.5 | 2.177 |
| 3 | 4 15 36.63 | 2.3788 | 21 28 45.3 | 9.118 | 3 | 6 11 12.53 | 2.4060 | 25 52 7.5 | 2.098 |
| 4 | 4 17 59.43 | 2.3811 | 21 37 40.2 | 8.983 | 4 | 6 13 36.84 | 2.4043 | 25 53 55.5 | 1.875 |
| 5 | 4 20 22.36 | 2.3833 | 21 46 26.8 | 8.846 | 5 | 6 16 1.05 | 2.4026 | 25 55 34.5 | 1.725 |
| 6 | 4 22 45.42 | 2.3855 | 21 55 5.1 | 8.708 | 6 | 6 18 25.16 | 2.4009 | 25 57 4.4 | 1.574 |
| 7 | 4 25 8.62 | 2.3877 | 22 3 35.1 | 8.569 | 7 | 6 20 49.16 | 2.3990 | 25 58 25.4 | 1.424 |
| 8 | 4 27 31.94 | 2.3897 | 22 11 56.7 | 8.430 | 8 | 6 23 13.04 | 2.3969 | 26 0 40.4 | 1.275 |
| 9 | 4 29 55.38 | 2.3917 | 22 20 10.0 | 8.291 | 9 | 6 25 36.79 | 2.3948 | 26 1 34.5 | 1.125 |
| 10 | 4 32 18.94 | 2.3937 | 22 28 14.8 | 8.151 | 10 | 6 28 0.42 | 2.3927 | 26 2 19.7 | 0.976 |
| 11 | 4 34 42.62 | 2.3956 | 22 36 11.1 | 8.009 | 11 | 6 30 23.92 | 2.3905 | 26 3 42.2 | 0.827 |
| 12 | 4 37 6.41 | 2.3974 | 22 43 58.8 | 7.866 | 12 | 6 32 47.28 | 2.3881 | 26 3 23.5 | 0.679 |
| 13 | 4 39 30.31 | 2.3992 | 22 51 37.9 | 7.723 | 13 | 6 35 10.49 | 2.3856 | 26 3 4.1 | 0.532 |
| 14 | 4 41 54.32 | 2.4009 | 22 59 8.4 | 7.580 | 14 | 6 37 33.55 | 2.3831 | 26 3 45.5 | 0.385 |
| 15 | 4 44 18.42 | 2.4025 | 23 6 30.3 | 7.437 | 15 | 6 39 56.46 | 2.3805 | 26 3 20.1 | 0.238 |
| 16 | 4 46 42.62 | 2.4041 | 23 13 43.5 | 7.292 | 16 | 6 42 19.21 | 2.3777 | 26 3 53.1 | + 0.091 |
| 17 | 4 49 6.91 | 2.4056 | 23 20 47.9 | 7.147 | 17 | 6 44 41.79 | 2.3749 | 26 3 4.1 | - 0.054 |
| 18 | 4 51 31.29 | 2.4070 | 23 27 43.6 | 7.001 | 18 | 6 47 4.20 | 2.3721 | 26 3 30.5 | 0.900 |
| 19 | 4 53 55.75 | 2.4083 | 23 34 30.5 | 6.855 | 19 | 6 49 26.44 | 2.3692 | 26 3 30.5 | 0.345 |
| 20 | 4 56 20.29 | 2.4096 | 23 41 8.5 | 6.708 | 20 | 6 51 48.50 | 2.3661 | 26 1 48.3 | 0.468 |
| 21 | 4 58 44.91 | 2.4109 | 23 47 37.7 | 6.560 | 21 | 6 54 10.37 | 2.3629 | 26 0 57.5 | 0.639 |
| 22 | 5 1 9.60 | 2.4120 | 23 53 58.0 | 6.412 | 22 | 6 56 32.05 | 2.3597 | 26 0 57.5 | 0.775 |
| 23 | 5 3 34.35 | 2.4130 | N. 24 0 9.3 | 6.263 | 23 | 6 58 53.54 | 2.3564 | N. 25 59 58.1 | 0.918 |
| 24 | 5 5 59.16 | 2.4140 | | 6.114 | 24 | 7 1 14.82 | 2.3530 | | 1.061 |
| SUNDAY 10. | | | | | TUESDAY 12. | | | | |
| 0 | 5 8 24.03 | 2.4149 | N. 24 6 11.7 | 5.965 | 0 | 7 3 35.90 | 2.3496 | N. 25 58 50.2 | 1.902 |
| 1 | 5 10 48.95 | 2.4157 | 24 12 5.1 | 5.816 | 1 | 7 5 56.77 | 2.3461 | 25 57 33.9 | 1.349 |
| 2 | 5 13 13.91 | 2.4164 | 24 17 49.6 | 5.667 | 2 | 7 8 17.43 | 2.3425 | 25 56 9.2 | 1.489 |
| 3 | 5 15 38.91 | 2.4170 | 24 23 25.1 | 5.516 | 3 | 7 10 37.87 | 2.3388 | 25 54 36.1 | 1.691 |
| 4 | 5 18 3.95 | 2.4176 | 24 28 51.5 | 5.365 | 4 | 7 12 58.08 | 2.3350 | 25 52 54.7 | 1.759 |
| 5 | 5 20 29.02 | 2.4180 | 24 34 8.9 | 5.215 | 5 | 7 15 18.07 | 2.3312 | 25 51 5.0 | 1.896 |
| 6 | 5 22 54.11 | 2.4183 | 24 39 17.3 | 5.064 | 6 | 7 17 37.83 | 2.3273 | 25 49 7.1 | 2.033 |
| 7 | 5 25 19.22 | 2.4186 | 24 44 16.6 | 4.912 | 7 | 7 19 57.35 | 2.3233 | 25 47 1.0 | 2.170 |
| 8 | 5 27 44.35 | 2.4188 | 24 49 6.8 | 4.761 | 8 | 7 22 16.63 | 2.3193 | 25 44 46.7 | 2.306 |
| 9 | 5 30 9.48 | 2.4189 | 24 53 47.9 | 4.609 | 9 | 7 24 35.67 | 2.3153 | 25 42 24.3 | 2.440 |
| 10 | 5 32 34.62 | 2.4189 | 24 58 19.9 | 4.457 | 10 | 7 26 54.47 | 2.3112 | 25 39 53.9 | 2.574 |
| 11 | 5 34 59.75 | 2.4188 | 25 2 42.8 | 4.305 | 11 | 7 29 13.01 | 2.3069 | 25 37 15.4 | 2.708 |
| 12 | 5 37 24.87 | 2.4186 | 25 6 56.5 | 4.153 | 12 | 7 31 31.30 | 2.3026 | 25 34 28.9 | 2.841 |
| 13 | 5 39 49.98 | 2.4183 | 25 11 1.1 | 4.001 | 13 | 7 33 49.33 | 2.2983 | 25 31 34.5 | 2.972 |
| 14 | 5 42 15.07 | 2.4179 | 25 14 56.6 | 3.849 | 14 | 7 36 7.10 | 2.2940 | 25 28 32.3 | 3.102 |
| 15 | 5 44 40.13 | 2.4174 | 25 18 43.0 | 3.697 | 15 | 7 38 24.61 | 2.2897 | 25 25 22.2 | 3.232 |
| 16 | 5 47 5.16 | 2.4168 | 25 22 20.2 | 3.544 | 16 | 7 40 41.86 | 2.2853 | 25 22 4.4 | 3.362 |
| 17 | 5 49 30.15 | 2.4162 | 25 25 48.3 | 3.392 | 17 | 7 42 58.83 | 2.2806 | 25 18 38.8 | 3.491 |
| 18 | 5 51 55.11 | 2.4156 | 25 29 7.2 | 3.239 | 18 | 7 45 15.53 | 2.2760 | 25 15 5.5 | 3.618 |
| 19 | 5 54 20.02 | 2.4147 | 25 32 17.0 | 3.087 | 19 | 7 47 31.95 | 2.2714 | 25 11 24.6 | 3.744 |
| 20 | 5 56 44.87 | 2.4137 | 25 35 17.7 | 2.935 | 20 | 7 49 48.10 | 2.2668 | 25 7 36.2 | 3.870 |
| 21 | 5 59 9.66 | 2.4126 | 25 38 9.2 | 2.783 | 21 | 7 52 3.97 | 2.2621 | 25 3 40.2 | 3.995 |
| 22 | 6 1 34.38 | 2.4115 | 25 40 51.6 | 2.631 | 22 | 7 54 19.55 | 2.2573 | 24 59 36.8 | 4.119 |
| 23 | 6 3 59.04 | 2.4103 | 25 43 24.9 | 2.480 | 23 | 7 56 34.85 | 2.2526 | 24 55 26.0 | 4.242 |
| 24 | 6 6 23.62 | 2.4090 | N. 25 45 49.2 | 2.329 | 24 | 7 58 49.86 | 2.2478 | N. 24 51 7.8 | 4.364 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|------------------|------------------------|---------------|------------------------|--------------|------------------|------------------------|----------------|------------------------|
| WEDNESDAY 13. | | | | | FRIDAY 15. | | | | |
| 0 | 7 58 49.86 | 2.2478 | N.24 51' 7.8" | 4.364 | 0 | 9 40 52.82 | 2.0060 | N.19 18' 20.2" | 9.148 |
| 1 | 8 1 4.58 | 2.2499 | 24 46 42.3 | 4.485 | 1 | 9 42 53.04 | 2.0013 | 19 9 9.0 | 9.225 |
| 2 | 8 3 19.01 | 2.2520 | 24 42 9.6 | 4.606 | 2 | 9 44 52.98 | 1.9967 | 18 59 53.2 | 9.302 |
| 3 | 8 5 33.14 | 2.2530 | 24 37 20.6 | 4.727 | 3 | 9 46 52.64 | 1.9921 | 18 50 32.8 | 9.377 |
| 4 | 8 7 46.97 | 2.2521 | 24 32 42.4 | 4.845 | 4 | 9 48 52.03 | 1.9876 | 18 41 7.9 | 9.452 |
| 5 | 8 10 0.51 | 2.2522 | 24 27 48.2 | 4.962 | 5 | 9 50 51.15 | 1.9831 | 18 31 38.5 | 9.527 |
| 6 | 8 12 13.75 | 2.2189 | 24 22 47.0 | 5.079 | 6 | 9 52 50.00 | 1.9786 | 18 22 4.6 | 9.601 |
| 7 | 8 14 26.69 | 2.2132 | 24 17 38.8 | 5.195 | 7 | 9 54 48.58 | 1.9749 | 18 12 26.4 | 9.673 |
| 8 | 8 16 39.33 | 2.2081 | 24 12 23.6 | 5.310 | 8 | 9 56 46.90 | 1.9698 | 18 2 43.9 | 9.744 |
| 9 | 8 18 51.66 | 2.2030 | 24 7 1.6 | 5.424 | 9 | 9 58 44.96 | 1.9655 | 17 52 57.1 | 9.815 |
| 10 | 8 21 3.69 | 2.1979 | 24 1 32.8 | 5.537 | 10 | 10 0 42.76 | 1.9610 | 17 43 6.1 | 9.885 |
| 11 | 8 23 15.41 | 2.1927 | 23 55 57.2 | 5.649 | 11 | 10 2 40.30 | 1.9569 | 17 33 10.9 | 9.954 |
| 12 | 8 25 26.82 | 2.1876 | 23 50 14.9 | 5.760 | 12 | 10 4 37.58 | 1.9530 | 17 23 11.6 | 10.022 |
| 13 | 8 27 37.92 | 2.1823 | 23 44 26.0 | 5.870 | 13 | 10 6 34.61 | 1.9485 | 17 13 8.2 | 10.090 |
| 14 | 8 29 48.72 | 2.1774 | 23 38 30.5 | 5.980 | 14 | 10 8 31.40 | 1.9445 | 17 3 0.8 | 10.158 |
| 15 | 8 31 59.21 | 2.1723 | 23 32 28.4 | 6.089 | 15 | 10 10 27.95 | 1.9404 | 16 52 49.3 | 10.224 |
| 16 | 8 34 9.39 | 2.1671 | 23 26 19.8 | 6.197 | 16 | 10 12 24.25 | 1.9363 | 16 42 33.9 | 10.288 |
| 17 | 8 36 19.26 | 2.1619 | 23 20 4.8 | 6.303 | 17 | 10 14 20.31 | 1.9323 | 16 32 14.7 | 10.352 |
| 18 | 8 38 28.82 | 2.1568 | 23 13 43.5 | 6.408 | 18 | 10 16 16.13 | 1.9284 | 16 21 51.6 | 10.416 |
| 19 | 8 40 38.07 | 2.1516 | 23 7 15.9 | 6.513 | 19 | 10 18 11.72 | 1.9246 | 16 11 24.7 | 10.479 |
| 20 | 8 42 47.01 | 2.1463 | 23 0 42.0 | 6.617 | 20 | 10 20 7.08 | 1.9208 | 16 0 54.1 | 10.542 |
| 21 | 8 44 55.63 | 2.1411 | 22 54 1.9 | 6.719 | 21 | 10 22 2.21 | 1.9170 | 15 50 19.7 | 10.603 |
| 22 | 8 47 3.94 | 2.1359 | 22 47 15.7 | 6.821 | 22 | 10 23 57.12 | 1.9133 | 15 39 41.7 | 10.663 |
| 23 | 8 49 11.94 | 2.1307 | N.22 40 23.4 | 6.922 | 23 | 10 25 51.81 | 1.9096 | N.15 29 0.1 | 10.723 |
| THURSDAY 14. | | | | | SATURDAY 16. | | | | |
| 0 | 8 51 19.63 | 2.1255 | N.22 33 25.0 | 7.022 | 0 | 10 27 46.27 | 1.9059 | N.15 18 14.9 | 10.782 |
| 1 | 8 53 27.00 | 2.1203 | 22 26 20.7 | 7.121 | 1 | 10 29 40.52 | 1.9024 | 15 7 26.2 | 10.841 |
| 2 | 8 55 34.07 | 2.1152 | 22 19 10.5 | 7.219 | 2 | 10 31 34.56 | 1.8989 | 14 56 34.0 | 10.898 |
| 3 | 8 57 40.83 | 2.1101 | 22 11 54.4 | 7.317 | 3 | 10 33 28.39 | 1.8955 | 14 45 38.4 | 10.955 |
| 4 | 8 59 47.28 | 2.1049 | 22 4 32.5 | 7.413 | 4 | 10 35 22.02 | 1.8921 | 14 34 39.4 | 11.012 |
| 5 | 9 1 53.42 | 2.0997 | 21 57 4.8 | 7.508 | 5 | 10 37 15.44 | 1.8887 | 14 23 37.0 | 11.068 |
| 6 | 9 3 59.25 | 2.0946 | 21 49 31.5 | 7.602 | 6 | 10 39 8.66 | 1.8854 | 14 12 31.3 | 11.123 |
| 7 | 9 6 4.77 | 2.0895 | 21 41 52.6 | 7.696 | 7 | 10 41 1.69 | 1.8822 | 14 1 22.3 | 11.177 |
| 8 | 9 8 9.99 | 2.0844 | 21 34 8.0 | 7.789 | 8 | 10 42 54.53 | 1.8791 | 13 50 10.1 | 11.230 |
| 9 | 9 10 14.90 | 2.0793 | 21 26 17.9 | 7.881 | 9 | 10 44 47.18 | 1.8759 | 13 38 54.8 | 11.281 |
| 10 | 9 12 19.51 | 2.0743 | 21 18 22.3 | 7.972 | 10 | 10 46 39.64 | 1.8728 | 13 27 36.4 | 11.333 |
| 11 | 9 14 23.82 | 2.0692 | 21 10 21.3 | 8.061 | 11 | 10 48 31.91 | 1.8697 | 13 16 14.9 | 11.384 |
| 12 | 9 16 27.82 | 2.0642 | 21 2 15.0 | 8.149 | 12 | 10 50 24.00 | 1.8667 | 13 4 50.3 | 11.435 |
| 13 | 9 18 31.52 | 2.0592 | 20 54 3.4 | 8.237 | 13 | 10 52 15.92 | 1.8639 | 12 53 22.7 | 11.484 |
| 14 | 9 20 34.92 | 2.0542 | 20 45 46.5 | 8.325 | 14 | 10 54 7.67 | 1.8611 | 12 41 52.2 | 11.533 |
| 15 | 9 22 38.03 | 2.0493 | 20 37 24.4 | 8.412 | 15 | 10 55 59.25 | 1.8583 | 12 30 18.7 | 11.582 |
| 16 | 9 24 40.84 | 2.0443 | 20 28 57.1 | 8.497 | 16 | 10 57 50.66 | 1.8556 | 12 18 42.3 | 11.630 |
| 17 | 9 26 43.35 | 2.0394 | 20 20 24.8 | 8.581 | 17 | 10 59 41.92 | 1.8530 | 12 7 3.1 | 11.677 |
| 18 | 9 28 45.57 | 2.0345 | 20 11 47.4 | 8.665 | 18 | 11 1 33.02 | 1.8504 | 11 55 21.1 | 11.723 |
| 19 | 9 30 47.49 | 2.0297 | 20 3 5.0 | 8.747 | 19 | 11 3 23.97 | 1.8478 | 11 43 36.4 | 11.768 |
| 20 | 9 32 49.13 | 2.0249 | 19 54 17.7 | 8.828 | 20 | 11 5 14.76 | 1.8453 | 11 31 49.0 | 11.813 |
| 21 | 9 34 50.48 | 2.0201 | 19 45 25.6 | 8.909 | 21 | 11 7 5.40 | 1.8428 | 11 19 58.8 | 11.858 |
| 22 | 9 36 51.54 | 2.0154 | 19 36 28.6 | 8.990 | 22 | 11 8 55.90 | 1.8406 | 11 8 6.0 | 11.902 |
| 23 | 9 38 52.32 | 2.0107 | 19 27 26.8 | 9.070 | 23 | 11 10 46.27 | 1.8383 | 10 56 10.6 | 11.944 |
| 24 | 9 40 52.82 | 2.0060 | N.19 18 20.2 | 9.148 | 24 | 11 12 36.50 | 1.8361 | N.10 44 12.7 | 11.986 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|------------|------------------|---------------------|-----------------|---------------------|---------------|------------------|---------------------|----------------|---------------------|
| SUNDAY 17. | | | | | TUESDAY 19. | | | | |
| 0 | 11 12 36.50 | 1.8361 | N. 10° 44' 12.7 | 11.986 | 0 | 12 39 22.92 | 1.8048 | N. 0° 32' 42.6 | 13.240 |
| 1 | 11 14 26.60 | 1.8339 | 10 32 12.3 | 12.028 | 1 | 12 41 11.24 | 1.8059 | 0 19 27.9 | 13.250 |
| 2 | 11 16 16.57 | 1.8318 | 10 20 9.4 | 12.069 | 2 | 12 42 59.63 | 1.8070 | N. 0° 6' 12.6 | 13.259 |
| 3 | 11 18 6.41 | 1.8297 | 10 8 4.0 | 12.110 | 3 | 12 44 48.08 | 1.8081 | S. 0° 7' 3.2 | 13.267 |
| 4 | 11 19 56.13 | 1.8277 | 9 55 56.2 | 12.149 | 4 | 12 46 36.60 | 1.8093 | 0 20 19.5 | 13.275 |
| 5 | 11 21 45.73 | 1.8258 | 9 43 46.1 | 12.187 | 5 | 12 48 25.20 | 1.8103 | 0 33 36.2 | 13.282 |
| 6 | 11 23 35.22 | 1.8239 | 9 31 33.8 | 12.224 | 6 | 12 50 13.87 | 1.8118 | 0 46 53.3 | 13.288 |
| 7 | 11 25 24.60 | 1.8222 | 9 19 19.2 | 12.262 | 7 | 12 52 2.62 | 1.8132 | 1 0 10.8 | 13.294 |
| 8 | 11 27 13.88 | 1.8204 | 9 7 2.3 | 12.300 | 8 | 12 53 51.46 | 1.8147 | 1 13 28.6 | 13.298 |
| 9 | 11 29 3.05 | 1.8187 | 8 54 43.2 | 12.337 | 9 | 12 55 40.39 | 1.8162 | 1 26 46.6 | 13.302 |
| 10 | 11 30 52.12 | 1.8171 | 8 42 21.9 | 12.372 | 10 | 12 57 29.41 | 1.8179 | 1 40 4.8 | 13.305 |
| 11 | 11 32 41.10 | 1.8156 | 8 29 58.5 | 12.406 | 11 | 12 59 18.54 | 1.8196 | 1 53 23.2 | 13.307 |
| 12 | 11 34 30.00 | 1.8142 | 8 17 33.1 | 12.440 | 12 | 13 1 7.77 | 1.8213 | 2 6 41.7 | 13.309 |
| 13 | 11 36 18.81 | 1.8127 | 8 5 5.7 | 12.474 | 13 | 13 2 57.10 | 1.8232 | 2 20 0.3 | 13.310 |
| 14 | 11 38 7.53 | 1.8113 | 7 52 36.2 | 12.508 | 14 | 13 4 46.55 | 1.8251 | 2 33 18.9 | 13.310 |
| 15 | 11 39 56.17 | 1.8101 | 7 40 4.7 | 12.541 | 15 | 13 6 36.11 | 1.8270 | 2 46 37.5 | 13.309 |
| 16 | 11 41 44.74 | 1.8089 | 7 27 31.3 | 12.572 | 16 | 13 8 25.79 | 1.8290 | 2 59 56.0 | 13.308 |
| 17 | 11 43 33.24 | 1.8077 | 7 14 56.1 | 12.603 | 17 | 13 10 15.59 | 1.8311 | 3 13 14.4 | 13.306 |
| 18 | 11 45 21.66 | 1.8065 | 7 2 19.0 | 12.633 | 18 | 13 12 5.52 | 1.8332 | 3 26 32.7 | 13.303 |
| 19 | 11 47 10.02 | 1.8056 | 6 49 40.1 | 12.663 | 19 | 13 13 55.58 | 1.8355 | 3 39 50.8 | 13.299 |
| 20 | 11 48 58.33 | 1.8047 | 6 36 59.4 | 12.693 | 20 | 13 15 45.78 | 1.8378 | 3 53 8.6 | 13.294 |
| 21 | 11 50 46.58 | 1.8038 | 6 24 17.0 | 12.721 | 21 | 13 17 36.11 | 1.8401 | 4 6 26.1 | 13.288 |
| 22 | 11 52 34.78 | 1.8029 | 6 11 32.9 | 12.748 | 22 | 13 19 26.59 | 1.8426 | 4 19 43.2 | 13.282 |
| 23 | 11 54 22.93 | 1.8021 | N. 5° 58' 47.2 | 12.776 | 23 | 13 21 17.22 | 1.8451 | S. 4° 33' 0.0 | 13.276 |
| MONDAY 18. | | | | | WEDNESDAY 20. | | | | |
| 0 | 11 56 11.03 | 1.8013 | N. 5° 45' 59.8 | 12.803 | 0 | 13 23 8.00 | 1.8476 | S. 4° 46' 16.3 | 13.268 |
| 1 | 11 57 59.09 | 1.8007 | 5 33 10.8 | 12.828 | 1 | 13 24 58.93 | 1.8502 | 4 59 32.1 | 13.259 |
| 2 | 11 59 47.12 | 1.8002 | 5 20 20.4 | 12.853 | 2 | 13 26 50.03 | 1.8530 | 5 12 47.4 | 13.249 |
| 3 | 12 1 35.12 | 1.7997 | 5 7 28.5 | 12.878 | 3 | 13 28 41.29 | 1.8558 | 5 26 2.0 | 13.238 |
| 4 | 12 3 23.09 | 1.7993 | 4 54 35.1 | 12.902 | 4 | 13 30 32.72 | 1.8586 | 5 39 16.0 | 13.227 |
| 5 | 12 5 11.04 | 1.7990 | 4 41 40.3 | 12.925 | 5 | 13 32 24.32 | 1.8615 | 5 52 29.8 | 13.215 |
| 6 | 12 6 58.97 | 1.7987 | 4 28 44.1 | 12.948 | 6 | 13 34 16.10 | 1.8645 | 6 5 41.8 | 13.202 |
| 7 | 12 8 46.88 | 1.7984 | 4 15 46.5 | 12.970 | 7 | 13 36 8.06 | 1.8676 | 6 18 53.5 | 13.188 |
| 8 | 12 10 34.78 | 1.7983 | 4 2 47.7 | 12.991 | 8 | 13 38 0.21 | 1.8707 | 6 32 4.3 | 13.173 |
| 9 | 12 12 22.68 | 1.7982 | 3 49 47.6 | 13.012 | 9 | 13 39 52.54 | 1.8738 | 6 45 14.3 | 13.158 |
| 10 | 12 14 10.57 | 1.7982 | 3 36 46.3 | 13.032 | 10 | 13 41 45.06 | 1.8770 | 6 58 23.3 | 13.141 |
| 11 | 12 15 58.46 | 1.7982 | 3 23 43.8 | 13.051 | 11 | 13 43 37.78 | 1.8804 | 7 11 31.2 | 13.124 |
| 12 | 12 17 46.35 | 1.7983 | 3 10 40.2 | 13.069 | 12 | 13 45 30.71 | 1.8838 | 7 24 38.1 | 13.106 |
| 13 | 12 19 34.25 | 1.7985 | 2 57 35.5 | 13.087 | 13 | 13 47 23.84 | 1.8872 | 7 37 43.9 | 13.086 |
| 14 | 12 21 22.17 | 1.7987 | 2 44 29.7 | 13.105 | 14 | 13 49 17.18 | 1.8907 | 7 50 48.4 | 13.065 |
| 15 | 12 23 10.10 | 1.7990 | 2 31 22.9 | 13.122 | 15 | 13 51 10.73 | 1.8942 | 8 3 51.7 | 13.044 |
| 16 | 12 24 58.05 | 1.7994 | 2 18 15.1 | 13.137 | 16 | 13 53 4.49 | 1.8979 | 8 16 53.7 | 13.022 |
| 17 | 12 26 46.03 | 1.7999 | 2 5 6.4 | 13.152 | 17 | 13 54 58.48 | 1.9017 | 8 29 54.3 | 12.999 |
| 18 | 12 28 34.04 | 1.8004 | 1 51 56.8 | 13.167 | 18 | 13 56 52.69 | 1.9054 | 8 42 53.5 | 12.975 |
| 19 | 12 30 22.08 | 1.8010 | 1 38 46.3 | 13.181 | 19 | 13 58 47.13 | 1.9092 | 8 55 51.3 | 12.950 |
| 20 | 12 32 10.16 | 1.8017 | 1 25 35.0 | 13.194 | 20 | 14 0 41.80 | 1.9132 | 9 8 47.5 | 12.923 |
| 21 | 12 33 58.28 | 1.8024 | 1 12 23.0 | 13.207 | 21 | 14 2 36.71 | 1.9172 | 9 21 42.1 | 12.896 |
| 22 | 12 35 46.45 | 1.8031 | 0 59 10.2 | 13.219 | 22 | 14 4 31.86 | 1.9212 | 9 34 35.0 | 12.868 |
| 23 | 12 37 34.66 | 1.8039 | 0 45 56.7 | 13.230 | 23 | 14 6 27.25 | 1.9252 | 9 47 26.2 | 12.839 |
| 24 | 12 39 22.92 | 1.8048 | N. 0° 32' 42.6 | 13.240 | 24 | 14 8 22.89 | 1.9294 | S. 10° 0' 15.7 | 12.810 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|-----------------|---------------------|--------------|------------------|---------------------|------------------|---------------------|
| THURSDAY 21. | | | | | SATURDAY 23. | | | | |
| 0 | 14 8 22.89 | 1.9994 | S. 10° 0' 15.7" | 12.810 | 0 | 15 46 51.60 | 2.1914 | S. 19° 18' 56.0" | 9.906 |
| 1 | 14 10 18.78 | 1.9337 | 10 13 3.4 | 12.778 | 1 | 15 49 3.27 | 2.1978 | 19 28 53.1 | 9.906 |
| 2 | 14 12 14.93 | 1.9380 | 10 25 49.1 | 12.745 | 2 | 15 51 15.33 | 2.2649 | 19 38 44.7 | 9.813 |
| 3 | 14 14 11.34 | 1.9423 | 10 38 32.8 | 12.712 | 3 | 15 53 27.77 | 2.2105 | 19 48 30.7 | 9.790 |
| 4 | 14 16 8.01 | 1.9467 | 10 51 14.5 | 12.678 | 4 | 15 55 40.59 | 2.2169 | 19 58 11.1 | 9.696 |
| 5 | 14 18 4.95 | 1.9512 | 11 3 54.2 | 12.643 | 5 | 15 57 53.80 | 2.2233 | 20 7 45.8 | 9.530 |
| 6 | 14 20 2.15 | 1.9557 | 11 16 31.7 | 12.607 | 6 | 16 0 7.39 | 2.2297 | 20 17 14.7 | 9.433 |
| 7 | 14 21 59.63 | 1.9603 | 11 29 7.0 | 12.569 | 7 | 16 2 21.36 | 2.2361 | 20 26 37.8 | 9.335 |
| 8 | 14 23 57.39 | 1.9650 | 11 41 40.0 | 12.530 | 8 | 16 4 35.72 | 2.2425 | 20 35 54.9 | 9.234 |
| 9 | 14 25 55.43 | 1.9698 | 11 54 10.6 | 12.490 | 9 | 16 6 50.46 | 2.2488 | 20 45 5.9 | 9.133 |
| 10 | 14 27 53.76 | 1.9746 | 12 6 38.8 | 12.450 | 10 | 16 9 5.58 | 2.2552 | 20 54 10.8 | 9.031 |
| 11 | 14 29 52.38 | 1.9794 | 12 19 4.6 | 12.408 | 11 | 16 11 21.09 | 2.2617 | 21 3 9.6 | 8.927 |
| 12 | 14 31 51.28 | 1.9842 | 12 31 27.8 | 12.365 | 12 | 16 13 36.98 | 2.2680 | 21 12 2.1 | 8.822 |
| 13 | 14 33 50.48 | 1.9892 | 12 43 48.4 | 12.321 | 13 | 16 15 53.25 | 2.2743 | 21 20 48.2 | 8.714 |
| 14 | 14 35 49.98 | 1.9942 | 12 56 6.3 | 12.276 | 14 | 16 18 9.90 | 2.2807 | 21 29 27.8 | 8.606 |
| 15 | 14 37 49.78 | 1.9993 | 13 8 21.5 | 12.229 | 15 | 16 20 26.94 | 2.2871 | 21 38 0.9 | 8.497 |
| 16 | 14 39 49.89 | 2.0044 | 13 20 33.8 | 12.181 | 16 | 16 22 44.36 | 2.2934 | 21 46 27.4 | 8.385 |
| 17 | 14 41 50.31 | 2.0095 | 13 32 43.2 | 12.132 | 17 | 16 25 2.15 | 2.2997 | 21 54 47.1 | 8.272 |
| 18 | 14 43 51.03 | 2.0147 | 13 44 49.7 | 12.082 | 18 | 16 27 20.32 | 2.3060 | 22 3 0.0 | 8.158 |
| 19 | 14 45 52.07 | 2.0200 | 13 56 53.1 | 12.031 | 19 | 16 29 38.87 | 2.3122 | 22 11 6.1 | 8.043 |
| 20 | 14 47 53.43 | 2.0253 | 14 8 53.4 | 11.979 | 20 | 16 31 57.79 | 2.3185 | 22 19 5.2 | 7.926 |
| 21 | 14 49 55.11 | 2.0307 | 14 20 50.6 | 11.926 | 21 | 16 34 17.09 | 2.3247 | 22 26 57.2 | 7.808 |
| 22 | 14 51 57.12 | 2.0362 | 14 32 44.5 | 11.871 | 22 | 16 36 35.76 | 2.3309 | 22 34 42.1 | 7.689 |
| 23 | 14 53 59.45 | 2.0416 | S. 14 44 35.1 | 11.814 | 23 | 16 38 54.80 | 2.3370 | S. 22 42 19.9 | 7.569 |
| FRIDAY 22. | | | | | SUNDAY 24. | | | | |
| 0 | 14 56 2.11 | 2.0472 | S. 14 56 22.2 | 11.757 | 0 | 16 41 17.20 | 2.3431 | S. 22 49 50.4 | 7.447 |
| 1 | 14 58 5.11 | 2.0527 | 15 8 5.9 | 11.699 | 1 | 16 43 37.97 | 2.3492 | 22 57 13.5 | 7.323 |
| 2 | 15 0 8.44 | 2.0583 | 15 19 46.1 | 11.639 | 2 | 16 45 59.10 | 2.3552 | 23 4 29.2 | 7.196 |
| 3 | 15 2 12.11 | 2.0640 | 15 31 22.6 | 11.578 | 3 | 16 48 20.60 | 2.3612 | 23 11 37.3 | 7.072 |
| 4 | 15 4 16.12 | 2.0697 | 15 42 55.4 | 11.516 | 4 | 16 50 42.45 | 2.3671 | 23 18 37.8 | 6.945 |
| 5 | 15 6 20.48 | 2.0755 | 15 54 24.5 | 11.453 | 5 | 16 53 4.65 | 2.3730 | 23 25 30.7 | 6.817 |
| 6 | 15 8 25.18 | 2.0813 | 16 5 49.7 | 11.388 | 6 | 16 55 27.21 | 2.3789 | 23 32 15.8 | 6.686 |
| 7 | 15 10 30.23 | 2.0871 | 16 17 11.0 | 11.322 | 7 | 16 57 50.12 | 2.3847 | 23 38 53.0 | 6.555 |
| 8 | 15 12 35.63 | 2.0930 | 16 28 28.3 | 11.254 | 8 | 17 0 13.37 | 2.3904 | 23 45 22.4 | 6.423 |
| 9 | 15 14 41.39 | 2.0990 | 16 39 41.5 | 11.186 | 9 | 17 2 36.96 | 2.3960 | 23 51 43.8 | 6.289 |
| 10 | 15 16 47.51 | 2.1049 | 16 50 50.6 | 11.116 | 10 | 17 5 0.89 | 2.4017 | 23 57 57.1 | 6.154 |
| 11 | 15 18 53.98 | 2.1108 | 17 1 55.4 | 11.044 | 11 | 17 7 25.16 | 2.4073 | 24 4 2.3 | 6.018 |
| 12 | 15 21 0.81 | 2.1168 | 17 12 55.9 | 10.972 | 12 | 17 9 49.76 | 2.4127 | 24 9 59.3 | 5.881 |
| 13 | 15 23 8.00 | 2.1229 | 17 23 52.0 | 10.898 | 13 | 17 12 14.68 | 2.4180 | 24 15 48.0 | 5.742 |
| 14 | 15 25 15.56 | 2.1291 | 17 34 43.6 | 10.823 | 14 | 17 14 39.92 | 2.4234 | 24 21 28.3 | 5.602 |
| 15 | 15 27 23.49 | 2.1352 | 17 45 30.7 | 10.747 | 15 | 17 17 5.49 | 2.4287 | 24 27 0.2 | 5.461 |
| 16 | 15 29 31.78 | 2.1414 | 17 56 13.2 | 10.668 | 16 | 17 19 31.37 | 2.4338 | 24 32 23.6 | 5.319 |
| 17 | 15 31 40.45 | 2.1476 | 18 6 50.9 | 10.588 | 17 | 17 21 57.55 | 2.4389 | 24 37 38.5 | 5.176 |
| 18 | 15 33 49.49 | 2.1538 | 18 17 23.8 | 10.508 | 18 | 17 24 24.04 | 2.4440 | 24 42 44.7 | 5.031 |
| 19 | 15 35 58.90 | 2.1600 | 18 27 51.9 | 10.427 | 19 | 17 26 50.83 | 2.4489 | 24 47 42.2 | 4.886 |
| 20 | 15 38 8.69 | 2.1662 | 18 38 15.0 | 10.343 | 20 | 17 29 17.91 | 2.4537 | 24 52 31.0 | 4.739 |
| 21 | 15 40 18.85 | 2.1725 | 18 48 33.0 | 10.258 | 21 | 17 31 45.28 | 2.4585 | 24 57 10.9 | 4.591 |
| 22 | 15 42 29.39 | 2.1788 | 18 58 45.9 | 10.172 | 22 | 17 34 12.93 | 2.4632 | 25 1 41.9 | 4.442 |
| 23 | 15 44 40.31 | 2.1851 | 19 8 53.6 | 10.084 | 23 | 17 36 40.87 | 2.4679 | 25 6 4.0 | 4.292 |
| 24 | 15 46 51.60 | 2.1914 | S. 19 18 56.0 | 9.996 | 24 | 17 39 9.08 | 2.4723 | S. 25 10 17.0 | 4.141 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|---|---------------------|------------------|---------------------|---------------|--|---------------------|------------------|---------------------|
| MONDAY 25. | | | | | WEDNESDAY 27. | | | | |
| 0 | 17 ^h 39 ^m 9.08 ^s | 2.4723 | S. 25° 10' 17.0" | 4.141 | 0 | 19 ^h 40 ^m 46.37 ^s | 2.5460 | S. 25° 22' 36.3" | 3.718 |
| 1 | 17 41 37.55 | 2.4767 | 25 14 20.9 | 3.990 | 1 | 19 43 19.08 | 2.5444 | 25 18 46.4 | 3.914 |
| 2 | 17 44 6.28 | 2.4810 | 25 18 15.8 | 3.838 | 2 | 19 45 51.69 | 2.5427 | 25 14 46.6 | 4.679 |
| 3 | 17 46 35.27 | 2.4852 | 25 22 1.5 | 3.684 | 3 | 19 48 24.20 | 2.5408 | 25 10 36.9 | 4.943 |
| 4 | 17 49 4.51 | 2.4893 | 25 25 37.9 | 3.529 | 4 | 19 50 56.59 | 2.5388 | 25 6 17.4 | 4.408 |
| 5 | 17 51 33.99 | 2.4939 | 25 29 5.0 | 3.374 | 5 | 19 53 28.86 | 2.5367 | 25 1 48.0 | 4.572 |
| 6 | 17 54 3.70 | 2.4971 | 25 32 22.8 | 3.218 | 6 | 19 56 1.00 | 2.5345 | 24 57 8.8 | 4.735 |
| 7 | 17 56 33.64 | 2.5008 | 25 35 31.2 | 3.061 | 7 | 19 58 33.00 | 2.5322 | 24 52 19.8 | 4.897 |
| 8 | 17 59 3.80 | 2.5045 | 25 38 30.1 | 2.903 | 8 | 20 1 4.86 | 2.5298 | 24 47 21.1 | 5.058 |
| 9 | 18 1 34.18 | 2.5081 | 25 41 19.5 | 2.744 | 9 | 20 3 36.58 | 2.5274 | 24 42 12.8 | 5.219 |
| 10 | 18 4 4.77 | 2.5115 | 25 43 59.4 | 2.584 | 10 | 20 6 8.15 | 2.5247 | 24 36 51.8 | 5.380 |
| 11 | 18 6 35.56 | 2.5147 | 25 46 29.6 | 2.423 | 11 | 20 8 39.55 | 2.5219 | 24 31 27.2 | 5.540 |
| 12 | 18 9 6.54 | 2.5179 | 25 48 50.2 | 2.263 | 12 | 20 11 10.78 | 2.5191 | 24 25 50.1 | 5.698 |
| 13 | 18 11 37.71 | 2.5210 | 25 51 1.2 | 2.102 | 13 | 20 13 41.84 | 2.5162 | 24 20 3.5 | 5.856 |
| 14 | 18 14 9.06 | 2.5239 | 25 53 2.4 | 1.939 | 14 | 20 16 12.73 | 2.5132 | 24 14 7.4 | 6.014 |
| 15 | 18 16 40.58 | 2.5267 | 25 54 53.9 | 1.776 | 15 | 20 18 43.43 | 2.5101 | 24 8 1.8 | 6.171 |
| 16 | 18 19 12.26 | 2.5294 | 25 56 35.6 | 1.612 | 16 | 20 21 13.94 | 2.5069 | 24 1 46.9 | 6.326 |
| 17 | 18 21 44.11 | 2.5321 | 25 58 7.4 | 1.448 | 17 | 20 23 44.26 | 2.5037 | 23 55 22.7 | 6.481 |
| 18 | 18 24 16.11 | 2.5345 | 25 59 29.4 | 1.284 | 18 | 20 26 11.39 | 2.5004 | 23 48 49.2 | 6.635 |
| 19 | 18 26 48.25 | 2.5367 | 26 0 41.5 | 1.119 | 19 | 20 28 44.31 | 2.4969 | 23 42 6.5 | 6.787 |
| 20 | 18 29 20.52 | 2.5389 | 26 1 43.7 | 0.953 | 20 | 20 31 14.02 | 2.4933 | 23 35 11.7 | 6.939 |
| 21 | 18 31 52.92 | 2.5410 | 26 2 35.9 | 0.787 | 21 | 20 33 43.51 | 2.4897 | 23 28 13.8 | 7.090 |
| 22 | 18 34 25.44 | 2.5428 | 26 3 18.1 | 0.621 | 22 | 20 36 12.79 | 2.4861 | 23 21 3.9 | 7.241 |
| 23 | 18 36 58.06 | 2.5446 | S. 26° 3' 50.4" | 0.455 | 23 | 20 38 41.81 | 2.4824 | S. 23° 13' 44.9" | 7.391 |
| TUESDAY 26. | | | | | THURSDAY 28. | | | | |
| 0 | 18 39 30.79 | 2.5463 | S. 26° 4' 12.7" | 0.288 | 0 | 20 41 10.67 | 2.4786 | S. 23° 6' 17.0" | 7.538 |
| 1 | 18 42 3.62 | 2.5478 | 26 4 24.9 | - 0.120 | 1 | 20 43 39.27 | 2.4747 | 22 58 40.3 | 7.685 |
| 2 | 18 44 36.53 | 2.5492 | 26 4 27.1 | + 0.048 | 2 | 20 46 7.63 | 2.4707 | 22 50 54.8 | 7.832 |
| 3 | 18 47 9.52 | 2.5504 | 26 4 19.2 | 0.216 | 3 | 20 48 35.75 | 2.4667 | 22 43 0.5 | 7.977 |
| 4 | 18 49 42.58 | 2.5516 | 26 4 1.2 | 0.384 | 4 | 20 51 3.63 | 2.4626 | 22 34 57.6 | 8.123 |
| 5 | 18 52 15.71 | 2.5526 | 26 3 33.1 | 0.553 | 5 | 20 53 31.26 | 2.4585 | 22 26 46.1 | 8.269 |
| 6 | 18 54 48.89 | 2.5534 | 26 2 51.8 | 0.722 | 6 | 20 55 58.65 | 2.4544 | 22 18 26.2 | 8.403 |
| 7 | 18 57 22.11 | 2.5541 | 26 2 6.4 | 0.891 | 7 | 20 58 25.79 | 2.4502 | 22 9 57.8 | 8.543 |
| 8 | 18 59 55.38 | 2.5547 | 26 1 7.9 | 1.059 | 8 | 21 0 52.67 | 2.4459 | 22 1 21.0 | 8.683 |
| 9 | 19 2 28.68 | 2.5552 | 25 59 59.3 | 1.228 | 9 | 21 3 19.29 | 2.4415 | 21 52 35.8 | 8.822 |
| 10 | 19 5 2.00 | 2.5554 | 25 58 40.5 | 1.397 | 10 | 21 5 45.65 | 2.4372 | 21 43 42.4 | 8.958 |
| 11 | 19 7 35.33 | 2.5556 | 25 57 11.6 | 1.566 | 11 | 21 8 11.75 | 2.4328 | 21 34 40.8 | 9.094 |
| 12 | 19 10 8.67 | 2.5556 | 25 55 32.6 | 1.735 | 12 | 21 10 37.59 | 2.4284 | 21 25 31.1 | 9.228 |
| 13 | 19 12 42.00 | 2.5555 | 25 53 43.4 | 1.904 | 13 | 21 13 3.16 | 2.4239 | 21 16 13.4 | 9.362 |
| 14 | 19 15 15.33 | 2.5553 | 25 51 44.1 | 2.072 | 14 | 21 15 28.46 | 2.4194 | 21 6 47.7 | 9.493 |
| 15 | 19 17 48.64 | 2.5550 | 25 49 34.7 | 2.241 | 15 | 21 17 53.49 | 2.4148 | 20 57 14.2 | 9.623 |
| 16 | 19 20 21.93 | 2.5545 | 25 47 15.2 | 2.410 | 16 | 21 20 18.24 | 2.4102 | 20 47 32.9 | 9.753 |
| 17 | 19 22 55.18 | 2.5538 | 25 44 45.5 | 2.579 | 17 | 21 22 42.72 | 2.4057 | 20 37 43.8 | 9.882 |
| 18 | 19 25 28.39 | 2.5531 | 25 42 5.7 | 2.747 | 18 | 21 25 6.93 | 2.4012 | 20 27 47.1 | 10.008 |
| 19 | 19 28 1.55 | 2.5522 | 25 39 15.9 | 2.914 | 19 | 21 27 30.86 | 2.3965 | 20 17 42.8 | 10.134 |
| 20 | 19 30 34.66 | 2.5512 | 25 36 16.0 | 3.082 | 20 | 21 29 54.51 | 2.3918 | 20 7 31.0 | 10.257 |
| 21 | 19 33 7.70 | 2.5501 | 25 33 6.1 | 3.249 | 21 | 21 32 17.88 | 2.3872 | 19 57 11.9 | 10.379 |
| 22 | 19 35 40.67 | 2.5488 | 25 29 46.1 | 3.416 | 22 | 21 34 40.97 | 2.3826 | 19 46 45.5 | 10.501 |
| 23 | 19 38 13.56 | 2.5475 | 25 26 16.2 | 3.582 | 23 | 21 37 3.79 | 2.3780 | 19 33 11.8 | 10.623 |
| 24 | 19 40 46.37 | 2.5460 | S. 25° 22' 36.3" | 3.748 | 24 | 21 39 26.33 | 2.3733 | S. 19° 25' 30.8" | 10.749 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|------------------|---------------------|------------------------------------|------------------|---------------------|---------------|---------------------|
| FRIDAY 29. | | | | | SUNDAY 31. | | | | |
| 0 | 21 39 26.33 | 2.3733 | S. 19° 25' 30.8" | 10.742 | 0 | 23 28 19.95 | 2.1794 | S. 9° 0' 1.6" | 14.766 |
| 1 | 21 41 48.59 | 2.3686 | 19 14 42.8 | 10.858 | 1 | 23 30 30.63 | 2.1767 | 8 45 14.2 | 14.814 |
| 2 | 21 44 10.56 | 2.3639 | 19 3 47.8 | 10.974 | 2 | 23 32 41.15 | 2.1740 | 8 30 23.9 | 14.861 |
| 3 | 21 46 32.25 | 2.3592 | 18 52 45.9 | 11.089 | 3 | 23 34 51.51 | 2.1713 | 8 15 30.9 | 14.906 |
| 4 | 21 48 53.96 | 2.3545 | 18 41 37.1 | 11.202 | 4 | 23 37 1.71 | 2.1687 | 8 0 35.2 | 14.950 |
| 5 | 21 51 14.79 | 2.3498 | 18 30 21.6 | 11.314 | 5 | 23 39 11.76 | 2.1663 | 7 45 36.9 | 14.992 |
| 6 | 21 53 35.64 | 2.3452 | 18 18 59.4 | 11.425 | 6 | 23 41 21.66 | 2.1638 | 7 30 36.1 | 15.033 |
| 7 | 21 55 56.21 | 2.3405 | 18 7 30.6 | 11.534 | 7 | 23 43 31.42 | 2.1615 | 7 15 32.9 | 15.073 |
| 8 | 21 58 16.50 | 2.3358 | 17 55 55.3 | 11.642 | 8 | 23 45 41.04 | 2.1592 | 7 0 27.3 | 15.112 |
| 9 | 22 0 36.51 | 2.3312 | 17 44 13.6 | 11.748 | 9 | 23 47 50.52 | 2.1569 | 6 45 19.5 | 15.148 |
| 10 | 22 2 56.24 | 2.3266 | 17 32 25.6 | 11.853 | 10 | 23 49 59.87 | 2.1546 | 6 30 9.5 | 15.184 |
| 11 | 22 5 15.70 | 2.3220 | 17 20 31.3 | 11.956 | 11 | 23 52 9.10 | 2.1527 | 6 14 57.4 | 15.217 |
| 12 | 22 7 34.88 | 2.3174 | 17 8 30.9 | 12.058 | 12 | 23 54 18.20 | 2.1507 | 5 59 43.4 | 15.249 |
| 13 | 22 9 53.79 | 2.3128 | 16 56 24.4 | 12.159 | 13 | 23 56 27.18 | 2.1488 | 5 44 27.5 | 15.281 |
| 14 | 22 12 12.42 | 2.3082 | 16 44 11.8 | 12.258 | 14 | 23 58 36.05 | 2.1470 | 5 29 9.7 | 15.311 |
| 15 | 22 14 30.78 | 2.3037 | 16 31 53.4 | 12.355 | 15 | 0 0 44.82 | 2.1452 | 5 13 50.2 | 15.339 |
| 16 | 22 16 48.87 | 2.2993 | 16 19 29.2 | 12.452 | 16 | 0 2 53.48 | 2.1435 | 4 58 29.0 | 15.366 |
| 17 | 22 19 6.70 | 2.2949 | 16 6 59.2 | 12.547 | 17 | 0 5 2.04 | 2.1418 | 4 43 6.3 | 15.390 |
| 18 | 22 21 24.26 | 2.2905 | 15 54 23.6 | 12.640 | 18 | 0 7 10.50 | 2.1402 | 4 27 42.2 | 15.414 |
| 19 | 22 23 41.56 | 2.2861 | 15 41 42.4 | 12.732 | 19 | 0 9 18.87 | 2.1386 | 4 12 16.7 | 15.437 |
| 20 | 22 25 58.59 | 2.2817 | 15 28 55.7 | 12.822 | 20 | 0 11 27.16 | 2.1375 | 3 56 49.8 | 15.458 |
| 21 | 22 28 15.36 | 2.2774 | 15 16 3.7 | 12.911 | 21 | 0 13 35.37 | 2.1361 | 3 41 21.7 | 15.478 |
| 22 | 22 30 31.87 | 2.2731 | 15 3 6.4 | 12.998 | 22 | 0 15 43.50 | 2.1348 | 3 25 52.5 | 15.496 |
| 23 | 22 32 48.13 | 2.2688 | S. 14 50 3.9 | 13.085 | 23 | 0 17 51.55 | 2.1336 | S. 3 10 22.2 | 15.512 |
| SATURDAY 30. | | | | | MONDAY, JUNE 1. | | | | |
| 0 | 22 35 4.13 | 2.2646 | S. 14 36 56.2 | 13.170 | 0 | 0 19 59.53 | 2.1325 | S. 2 54 51.0 | 15.527 |
| 1 | 22 37 19.88 | 2.2605 | 14 23 43.5 | 13.253 | PHASES OF THE MOON. | | | | |
| 2 | 22 39 35.39 | 2.2564 | 14 10 25.8 | 13.335 | | | | | |
| 3 | 22 41 50.65 | 2.2523 | 13 57 3.3 | 13.415 | | | | | |
| 4 | 22 44 5.67 | 2.2483 | 13 43 36.0 | 13.494 | | | | | |
| 5 | 22 46 20.45 | 2.2443 | 13 30 4.0 | 13.572 | ☾ Last Quarter . . . May 1 1 51.1 | | | | |
| 6 | 22 48 34.99 | 2.2404 | 13 16 27.4 | 13.648 | ● New Moon 7 18 15.5 | | | | |
| 7 | 22 50 49.30 | 2.2366 | 13 2 46.3 | 13.722 | ☾ First Quarter 15 7 4.4 | | | | |
| 8 | 22 53 3.38 | 2.2327 | 12 49 0.8 | 13.795 | ○ Full Moon 23 6 25.9 | | | | |
| 9 | 22 55 17.22 | 2.2289 | 12 35 10.9 | 13.867 | ☾ Last Quarter 30 6 54.4 | | | | |
| 10 | 22 57 30.84 | 2.2252 | 12 21 16.8 | 13.937 | | | | | |
| 11 | 22 59 44.24 | 2.2216 | 12 7 18.5 | 14.006 | | | | | |
| 12 | 23 1 57.43 | 2.2180 | 11 53 16.1 | 14.073 | | | | | |
| 13 | 23 4 10.40 | 2.2144 | 11 39 9.7 | 14.139 | | | | | |
| 14 | 23 6 23.16 | 2.2109 | 11 24 59.4 | 14.202 | | | | | |
| 15 | 23 8 35.71 | 2.2075 | 11 10 45.4 | 14.264 | | | | | |
| 16 | 23 10 48.06 | 2.2041 | 10 56 27.7 | 14.326 | | | | | |
| 17 | 23 13 0.21 | 2.2008 | 10 42 6.3 | 14.387 | | | | | |
| 18 | 23 15 12.16 | 2.1976 | 10 27 41.2 | 14.446 | | | | | |
| 19 | 23 17 23.92 | 2.1944 | 10 13 12.7 | 14.503 | | | | | |
| 20 | 23 19 35.49 | 2.1912 | 9 58 40.9 | 14.558 | ☾ Perigee May 4 20.6 | | | | |
| 21 | 23 21 46.87 | 2.1882 | 9 44 5.8 | 14.612 | ☾ Apogee 16 16.9 | | | | |
| 22 | 23 23 58.07 | 2.1852 | 9 29 27.5 | 14.664 | ☾ Perigee 31 9.1 | | | | |
| 23 | 23 26 9.10 | 2.1823 | 9 14 46.1 | 14.716 | | | | | |
| 24 | 23 28 19.95 | 2.1794 | S. 9 0 1.6 | 14.766 | | | | | |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|----|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|
| 1 | Spica | W. | 107° 13' 25" | 2359 | 108° 57' 58" | 2352 | 110° 42' 42" | 2344 | 112° 27' 37" | 2336 |
| | Antares | W. | 61 19 47 | 2352 | 63 4 31 | 2344 | 64 49 27 | 2335 | 66 34 36 | 2326 |
| | α Pegasi | E. | 47 58 42 | 3165 | 46 31 51 | 3206 | 45 5 49 | 3253 | 43 40 43 | 3307 |
| | VENUS | E. | 54 59 12 | 2728 | 53 23 9 | 2719 | 51 46 55 | 2710 | 50 10 29 | 2701 |
| | SUN | E. | 91 0 20 | 2650 | 89 22 33 | 2641 | 87 44 34 | 2633 | 86 6 23 | 2623 |
| 2 | Antares | W. | 75 23 28 | 2284 | 77 9 51 | 2277 | 78 56 25 | 2269 | 80 43 10 | 2262 |
| | VENUS | E. | 42 5 27 | 2660 | 40 27 54 | 2653 | 38 50 11 | 2646 | 37 12 18 | 2639 |
| | SUN | E. | 77 52 25 | 2580 | 76 13 2 | 2572 | 74 33 28 | 2564 | 72 53 43 | 2556 |
| 3 | Antares | W. | 89 39 32 | 2228 | 91 27 18 | 2223 | 93 15 12 | 2217 | 95 3 14 | 2212 |
| | α Aquilæ | W. | 50 17 11 | 3748 | 51 33 7 | 3667 | 52 50 29 | 3592 | 54 9 12 | 3525 |
| | VENUS | E. | 29 0 42 | 2610 | 27 22 1 | 2606 | 25 43 14 | 2602 | 24 4 22 | 2601 |
| | SUN | E. | 64 32 24 | 2590 | 62 51 39 | 2515 | 61 10 46 | 2508 | 59 29 44 | 2502 |
| 4 | Antares | W. | 104 5 14 | 2190 | 105 53 56 | 2187 | 107 42 43 | 2185 | 109 31 33 | 2182 |
| | α Aquilæ | W. | 60 59 39 | 3264 | 62 24 33 | 3225 | 63 50 13 | 3189 | 65 16 35 | 3157 |
| | SUN | E. | 51 2 45 | 2480 | 49 21 3 | 2476 | 47 39 16 | 2472 | 45 57 24 | 2470 |
| 5 | α Aquilæ | W. | 72 36 55 | 3040 | 74 6 18 | 3024 | 75 36 1 | 3011 | 77 6 0 | 3000 |
| | Fomalhaut | W. | 37 56 53 | 2625 | 39 35 14 | 2589 | 41 14 24 | 2559 | 42 54 15 | 2534 |
| | SUN | E. | 37 27 27 | 2465 | 35 45 24 | 2466 | 34 3 23 | 2467 | 32 21 23 | 2468 |
| 6 | α Aquilæ | W. | 84 38 34 | 2974 | 86 9 19 | 2975 | 87 40 3 | 2977 | 89 10 44 | 2981 |
| | Fomalhaut | W. | 51 20 42 | 2455 | 53 2 59 | 2446 | 54 45 28 | 2438 | 56 28 8 | 2433 |
| | α Pegasi | W. | 37 28 6 | 3470 | 38 49 4 | 3373 | 40 11 51 | 3291 | 41 36 13 | 3230 |
| | SUN | E. | 23 52 15 | 2487 | 22 10 42 | 2492 | 20 29 19 | 2500 | 18 48 6 | 2509 |
| 9 | SUN | W. | 16 6 44 | 2741 | 17 42 29 | 2752 | 19 18 0 | 2765 | 20 53 14 | 2779 |
| | Pollux | E. | 47 24 57 | 2416 | 45 41 45 | 2431 | 43 58 54 | 2446 | 42 16 25 | 2461 |
| | Regulus | E. | 83 39 6 | 2420 | 81 56 0 | 2435 | 80 13 15 | 2450 | 78 30 51 | 2465 |
| 10 | SUN | W. | 28 44 34 | 2857 | 30 17 48 | 2873 | 31 50 42 | 2889 | 33 23 15 | 2906 |
| | Pollux | E. | 33 49 35 | 2544 | 32 9 23 | 2562 | 30 29 36 | 2580 | 28 50 14 | 2599 |
| | Regulus | E. | 70 4 16 | 2543 | 68 24 3 | 2559 | 66 44 12 | 2576 | 65 4 44 | 2592 |
| 11 | SUN | W. | 41 0 38 | 2990 | 42 31 3 | 3007 | 44 1 7 | 3025 | 45 30 49 | 3041 |
| | MARS | W. | 16 59 14 | 2883 | 18 31 54 | 2901 | 20 4 12 | 2917 | 21 36 9 | 2935 |
| | Regulus | E. | 56 53 2 | 2676 | 55 15 50 | 2692 | 53 39 0 | 2709 | 52 2 32 | 2726 |
| | SATURN | E. | 68 49 25 | 2661 | 67 11 53 | 2677 | 65 34 42 | 2693 | 63 57 53 | 2709 |
| | Spica | E. | 110 56 31 | 2678 | 109 19 21 | 2693 | 107 42 32 | 2709 | 106 6 4 | 2724 |
| 12 | SUN | W. | 52 54 15 | 3123 | 54 21 57 | 3139 | 55 49 19 | 3154 | 57 16 23 | 3169 |
| | MARS | W. | 29 10 44 | 3014 | 30 40 39 | 3030 | 32 10 15 | 3045 | 33 39 32 | 3060 |
| | Regulus | E. | 44 5 48 | 2810 | 42 31 33 | 2826 | 40 57 39 | 2843 | 39 24 7 | 2860 |
| | SATURN | E. | 55 59 3 | 2788 | 54 24 19 | 2802 | 52 49 54 | 2818 | 51 15 49 | 2832 |
| | Spica | E. | 98 8 44 | 2799 | 96 34 15 | 2814 | 95 0 5 | 2828 | 93 26 13 | 2842 |
| 13 | SUN | W. | 64 27 17 | 3242 | 65 52 37 | 3254 | 67 17 42 | 3267 | 68 42 32 | 3280 |
| | Regulus | E. | 31 41 51 | 2945 | 30 10 29 | 2963 | 28 39 30 | 2982 | 27 8 55 | 3001 |
| | SATURN | E. | 43 30 4 | 2902 | 41 57 48 | 2916 | 40 25 50 | 2929 | 38 54 8 | 2942 |
| | Spica | E. | 85 41 22 | 2909 | 84 9 14 | 2922 | 82 37 23 | 2934 | 81 5 47 | 2946 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|--------------|----------------|-------------|----------------|--------------|----------------|-------------|----------------|
| 1 | Spica W. | 114° 12' 44" | 2328 | 115° 58' 2" | 2322 | 117° 43' 30" | 2314 | 119° 29' 9" | 2308 |
| | Antares W. | 68 19 58 | 2317 | 70 5 32 | 2309 | 71 51 19 | 2301 | 73 37 17 | 2292 |
| | α Pegasi E. | 42 16 40 | 3370 | 40 53 49 | 3441 | 39 32 19 | 3524 | 38 12 21 | 3690 |
| | VENUS E. | 48 33 51 | 2693 | 46 57 2 | 2681 | 45 20 1 | 2676 | 43 42 49 | 2669 |
| | SUN E. | 84 27 59 | 2615 | 82 49 24 | 2605 | 81 10 36 | 2596 | 79 31 36 | 2588 |
| 2 | Antares W. | 82 30 6 | 2255 | 84 17 12 | 2247 | 86 4 29 | 2241 | 87 51 56 | 2235 |
| | VENUS E. | 35 34 16 | 2632 | 33 56 5 | 2626 | 32 17 45 | 2620 | 30 39 17 | 2615 |
| | SUN E. | 71 13 48 | 2548 | 69 33 42 | 2541 | 67 53 26 | 2534 | 66 13 0 | 2527 |
| 3 | Antares W. | 96 51 24 | 2306 | 98 39 42 | 2302 | 100 28 6 | 2198 | 102 16 37 | 2194 |
| | α Aquilæ W. | 55 29 9 | 3462 | 56 50 16 | 3466 | 58 12 26 | 3354 | 59 35 35 | 3306 |
| | VENUS E. | 22 25 28 | 2599 | 20 46 32 | 2600 | 19 7 37 | 2603 | 17 28 46 | 2607 |
| | SUN E. | 57 48 34 | 2497 | 56 7 16 | 2493 | 54 25 52 | 2487 | 52 44 21 | 2484 |
| 4 | Antares W. | 111 20 27 | 2181 | 113 9 23 | 2179 | 114 58 22 | 2178 | 116 47 22 | 2178 |
| | α Aquilæ W. | 66 43 36 | 3128 | 68 11 12 | 3103 | 69 39 19 | 3079 | 71 7 54 | 3058 |
| | SUN E. | 44 15 29 | 2468 | 42 33 31 | 2467 | 40 51 31 | 2466 | 39 9 30 | 2465 |
| 5 | α Aquilæ W. | 78 36 13 | 2990 | 80 6 38 | 2984 | 81 37 11 | 2978 | 83 7 51 | 2976 |
| | Fomalhaut W. | 44 34 41 | 2512 | 46 15 37 | 2494 | 47 56 58 | 2479 | 49 38 41 | 2466 |
| | SUN E. | 30 39 25 | 2470 | 28 57 30 | 2474 | 27 15 40 | 2477 | 25 33 55 | 2481 |
| 6 | α Aquilæ W. | 90 41 20 | 2988 | 92 11 48 | 2997 | 93 42 5 | 3006 | 95 12 10 | 3018 |
| | Fomalhaut W. | 58 10 55 | 2430 | 59 53 47 | 2427 | 61 36 43 | 2426 | 63 19 40 | 2427 |
| | α Pegasi W. | 43 1 59 | 3158 | 44 28 59 | 3103 | 45 57 5 | 3056 | 47 26 8 | 3015 |
| | SUN E. | 17 7 5 | 2520 | 15 26 19 | 2531 | 13 45 49 | 2545 | 12 5 38 | 2561 |
| 9 | SUN W. | 22 28 10 | 2794 | 24 2 46 | 2808 | 25 37 3 | 2825 | 27 10 59 | 2841 |
| | Pollux E. | 40 34 17 | 2477 | 38 52 32 | 2494 | 37 11 10 | 2510 | 35 30 11 | 2527 |
| | Regulus E. | 76 48 49 | 2480 | 75 7 8 | 2496 | 73 25 49 | 2513 | 71 44 52 | 2527 |
| 10 | SUN W. | 34 55 26 | 2923 | 36 27 16 | 2939 | 37 58 45 | 2957 | 39 29 52 | 2973 |
| | Pollux E. | 27 11 17 | 2618 | 25 32 46 | 2638 | 23 54 42 | 2657 | 22 17 5 | 2678 |
| | Regulus E. | 63 25 38 | 2609 | 61 46 55 | 2626 | 60 8 35 | 2643 | 58 30 37 | 2659 |
| 11 | SUN W. | 47 0 11 | 3058 | 48 29 12 | 3074 | 49 57 53 | 3091 | 51 26 14 | 3107 |
| | MARS W. | 23 7 44 | 2950 | 24 38 59 | 2966 | 26 9 54 | 2982 | 27 40 29 | 2998 |
| | Regulus E. | 50 23 27 | 2743 | 48 50 44 | 2760 | 47 15 23 | 2777 | 45 40 25 | 2793 |
| | SATURN E. | 62 21 25 | 2725 | 60 45 18 | 2741 | 59 9 32 | 2756 | 57 34 7 | 2772 |
| | Spica E. | 104 29 56 | 2739 | 102 54 8 | 2754 | 101 18 40 | 2769 | 99 43 32 | 2785 |
| 12 | SUN W. | 58 43 9 | 3184 | 60 9 37 | 3199 | 61 35 47 | 3214 | 63 1 40 | 3227 |
| | MARS W. | 35 8 31 | 3074 | 36 37 12 | 3089 | 38 5 35 | 3103 | 39 33 41 | 3118 |
| | Regulus E. | 37 50 57 | 2876 | 36 18 8 | 2894 | 34 45 41 | 2910 | 33 13 35 | 2927 |
| | SATURN E. | 49 42 3 | 2847 | 48 8 36 | 2861 | 46 35 27 | 2876 | 45 2 37 | 2889 |
| | Spica E. | 91 52 40 | 2856 | 90 19 25 | 2869 | 88 46 27 | 2883 | 87 13 46 | 2896 |
| 13 | SUN W. | 70 7 7 | 3292 | 71 31 28 | 3304 | 72 55 35 | 3315 | 74 19 29 | 3325 |
| | Regulus E. | 25 38 44 | 3022 | 24 8 59 | 3044 | 22 39 41 | 3067 | 21 10 51 | 3091 |
| | SATURN E. | 37 22 43 | 2954 | 35 51 33 | 2967 | 34 20 39 | 2979 | 32 50 0 | 2992 |
| | Spica E. | 79 34 26 | 2958 | 78 3 20 | 2968 | 76 32 27 | 2979 | 75 1 48 | 2989 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|----|-------------|----------------|------------|----------------|-------------|----------------|------------|----------------|
| 14 | SUN | W. | 75° 43' 11" | 3336 | 77° 6' 41" | 3346 | 78° 29' 59" | 3356 | 79° 53' 6" | 3365 |
| | Pollux | W. | 17 21 45 | 3039 | 18 51 18 | 3034 | 20 20 49 | 3037 | 21 50 16 | 3039 |
| | SATURN | E. | 31 19 37 | 3003 | 29 49 28 | 3015 | 28 19 34 | 3027 | 26 49 55 | 3039 |
| | Spica | E. | 73 31 21 | 2999 | 72 1 7 | 3009 | 70 31 6 | 3018 | 69 1 16 | 3026 |
| | Antares | E. | 119 25 5 | 2992 | 117 54 42 | 3001 | 116 24 30 | 3009 | 114 54 29 | 3017 |
| 15 | SUN | W. | 86 46 17 | 3402 | 88 8 31 | 3408 | 89 30 38 | 3414 | 90 52 39 | 3419 |
| | Pollux | W. | 29 16 29 | 3059 | 30 45 29 | 3063 | 32 14 24 | 3066 | 33 43 15 | 3070 |
| | Spica | E. | 61 34 37 | 3065 | 60 5 45 | 3071 | 58 37 0 | 3078 | 57 8 23 | 3083 |
| | Antares | E. | 107 26 39 | 3051 | 105 57 29 | 3056 | 104 28 25 | 3060 | 102 59 27 | 3065 |
| 16 | SUN | W. | 97 41 31 | 3435 | 99 3 8 | 3438 | 100 24 42 | 3439 | 101 46 14 | 3439 |
| | Pollux | W. | 41 6 37 | 3080 | 42 35 11 | 3082 | 44 3 43 | 3082 | 45 32 15 | 3082 |
| | Spica | E. | 49 46 51 | 3105 | 48 18 48 | 3109 | 46 50 49 | 3112 | 45 22 54 | 3114 |
| | Antares | E. | 95 35 50 | 3081 | 94 7 17 | 3082 | 92 38 46 | 3083 | 91 10 16 | 3084 |
| 17 | SUN | W. | 108 33 56 | 3436 | 109 55 32 | 3433 | 111 17 11 | 3431 | 112 38 53 | 3428 |
| | Pollux | W. | 52 54 58 | 3077 | 54 23 36 | 3075 | 55 52 16 | 3072 | 57 21 0 | 3069 |
| | Regulus | W. | 17 14 15 | 3029 | 18 39 46 | 3028 | 20 5 46 | 3187 | 21 32 11 | 3188 |
| | Spica | E. | 38 4 6 | 3127 | 36 36 29 | 3129 | 35 8 54 | 3130 | 33 41 21 | 3133 |
| | Antares | E. | 83 47 48 | 30e1 | 82 19 15 | 3079 | 80 50 40 | 3077 | 79 22 2 | 3073 |
| 18 | SUN | W. | 119 28 27 | 3403 | 120 50 40 | 3399 | 122 12 58 | 3393 | 123 35 23 | 3386 |
| | Pollux | W. | 64 45 50 | 3047 | 66 15 5 | 3041 | 67 44 27 | 3034 | 69 13 57 | 3029 |
| | Regulus | W. | 28 48 58 | 3102 | 30 17 5 | 3099 | 31 45 24 | 3082 | 33 13 56 | 3072 |
| | SATURN | W. | 16 41 10 | 3119 | 18 8 56 | 3104 | 19 37 1 | 3089 | 21 5 24 | 3075 |
| | Antares | E. | 71 57 49 | 3054 | 70 28 43 | 3048 | 68 59 30 | 3043 | 67 30 10 | 3037 |
| 19 | Pollux | W. | 76 43 29 | 2992 | 78 13 52 | 2984 | 79 44 25 | 2975 | 81 15 9 | 2957 |
| | Regulus | W. | 40 39 42 | 3021 | 42 9 29 | 3011 | 43 39 28 | 3001 | 45 9 40 | 2990 |
| | SATURN | W. | 28 31 6 | 3019 | 30 0 55 | 3009 | 31 30 57 | 2998 | 33 1 12 | 2987 |
| | Antares | E. | 60 1 35 | 3003 | 58 31 26 | 2995 | 57 1 7 | 2988 | 55 30 39 | 2979 |
| | α Aquilæ | E. | 106 14 56 | 2855 | 105 0 50 | 2835 | 103 46 24 | 2816 | 102 31 38 | 2796 |
| 20 | Pollux | W. | 88 51 38 | 2919 | 90 23 33 | 2909 | 91 55 40 | 2898 | 93 28 1 | 2888 |
| | Regulus | W. | 52 43 56 | 2937 | 54 15 28 | 2926 | 55 47 14 | 2915 | 57 19 14 | 2904 |
| | SATURN | W. | 40 35 49 | 2934 | 42 7 25 | 2923 | 43 39 15 | 2912 | 45 11 19 | 2901 |
| | Antares | E. | 47 55 39 | 2936 | 46 24 6 | 2927 | 44 52 22 | 2918 | 43 20 26 | 2909 |
| | α Aquilæ | E. | 96 13 10 | 2715 | 94 56 39 | 2701 | 93 39 53 | 2689 | 92 22 54 | 2676 |
| 21 | Pollux | W. | 101 13 11 | 2833 | 102 46 56 | 2822 | 104 20 55 | 2811 | 105 55 9 | 2799 |
| | Regulus | W. | 65 2 53 | 2846 | 66 36 21 | 2834 | 68 10 5 | 2822 | 69 44 4 | 2811 |
| | SATURN | W. | 52 55 15 | 2843 | 54 28 47 | 2832 | 56 2 32 | 2821 | 57 36 34 | 2808 |
| | Antares | E. | 35 37 55 | 2865 | 34 4 51 | 2857 | 32 31 37 | 2849 | 30 58 13 | 2842 |
| | α Aquilæ | E. | 85 54 56 | 2626 | 84 36 50 | 2620 | 83 18 37 | 2613 | 82 0 17 | 2609 |
| | Fomalhaut | E. | 117 57 48 | 2043 | 116 28 29 | 2026 | 114 58 48 | 2009 | 113 28 47 | 1993 |
| 22 | Regulus | W. | 77 37 49 | 2752 | 79 13 20 | 2740 | 80 49 7 | 2729 | 82 25 9 | 2716 |
| | SATURN | W. | 65 30 32 | 2750 | 67 6 6 | 2738 | 68 41 55 | 2726 | 70 18 0 | 2715 |
| | Spica | W. | 23 55 38 | 2859 | 25 28 50 | 2835 | 27 2 33 | 2811 | 28 36 46 | 2791 |
| | α Aquilæ | E. | 75 27 40 | 2600 | 74 9 6 | 2602 | 72 50 34 | 2606 | 71 32 6 | 2612 |
| | Fomalhaut | E. | 105 53 44 | 2917 | 104 21 47 | 2903 | 102 49 32 | 2890 | 101 17 0 | 2876 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XV ^h . | P. L. of Diff. | XVIII ^h . | P. L. of Diff. | XXI ^h . | P. L. of Diff. |
|-------------------|-------------------------------|----|------------|----------------|-------------------|----------------|----------------------|----------------|--------------------|----------------|
| 14 | SUN | W. | 81° 16' 2" | 3373 | 82° 38' 49" | 3381 | 84° 1' 27" | 3389 | 85° 23' 56" | 3396 |
| | Pollux | W. | 23 19 40 | 3043 | 24 48 59 | 3047 | 26 18 14 | 3051 | 27 47 24 | 3055 |
| | SATURN | E. | 25 20 30 | 3051 | 23 51 20 | 3063 | 22 22 25 | 3076 | 20 53 46 | 3091 |
| | Spica | E. | 07 31 36 | 3035 | 66 2 7 | 3043 | 64 32 48 | 3051 | 63 3 38 | 3058 |
| | Antares | E. | 113 24 37 | 3095 | 111 54 55 | 3031 | 110 25 21 | 3039 | 108 55 56 | 3045 |
| 15 | SUN | W. | 92 14 34 | 3423 | 93 36 24 | 3427 | 94 58 10 | 3431 | 96 19 52 | 3433 |
| | Pollux | W. | 35 12 1 | 3073 | 36 40 44 | 3075 | 38 9 24 | 3077 | 39 38 2 | 3079 |
| | Spica | E. | 55 39 53 | 3088 | 54 11 29 | 3093 | 52 43 11 | 3097 | 51 14 58 | 3102 |
| | Antares | E. | 101 30 35 | 3089 | 100 1 48 | 3073 | 98 33 5 | 3076 | 97 4 26 | 3078 |
| 16 | SUN | W. | 103 7 46 | 3440 | 104 29 17 | 3439 | 105 50 49 | 3438 | 107 12 22 | 3438 |
| | Pollux | W. | 47 0 46 | 3082 | 48 29 17 | 3082 | 49 57 49 | 3081 | 51 26 22 | 3078 |
| | Spica | E. | 43 55 2 | 3117 | 42 27 13 | 3120 | 40 59 28 | 3123 | 39 31 46 | 3124 |
| | Antares | E. | 89 41 47 | 3084 | 88 13 18 | 3064 | 86 44 49 | 3083 | 85 16 19 | 3082 |
| 17 | SUN | W. | 114 0 38 | 3423 | 115 22 28 | 3420 | 116 44 22 | 3415 | 118 6 21 | 3409 |
| | Pollux | W. | 58 49 48 | 3065 | 60 18 40 | 3080 | 61 47 38 | 3056 | 63 16 41 | 3052 |
| | Regulus | W. | 22 58 58 | 3153 | 24 26 4 | 3138 | 25 53 27 | 3126 | 27 21 5 | 3114 |
| | Spica | E. | 32 13 52 | 3136 | 30 46 26 | 3130 | 29 19 4 | 3143 | 27 51 47 | 3148 |
| | Antares | E. | 77 53 20 | 3070 | 76 24 34 | 3067 | 74 55 44 | 3063 | 73 26 49 | 3059 |
| 18 | SUN | W. | 124 57 56 | 3379 | 126 20 37 | 3371 | 127 43 27 | 3363 | 129 6 26 | 3354 |
| | Pollux | W. | 70 43 34 | 3022 | 72 13 19 | 3015 | 73 43 13 | 3008 | 75 13 16 | 3000 |
| | Regulus | W. | 34 42 40 | 3061 | 36 11 37 | 3052 | 37 40 46 | 3041 | 39 10 8 | 3031 |
| | SATURN | W. | 22 34 4 | 3063 | 24 2 59 | 3058 | 25 32 8 | 3041 | 27 1 30 | 3030 |
| | Antares | E. | 66 0 43 | 3030 | 64 31 8 | 3035 | 63 1 26 | 3018 | 61 31 35 | 3010 |
| 19 | Pollux | W. | 82 46 3 | 2958 | 84 17 9 | 2948 | 85 48 27 | 2939 | 87 19 56 | 2929 |
| | Regulus | W. | 46 40 5 | 2980 | 48 10 43 | 2960 | 49 41 34 | 2959 | 51 12 38 | 2948 |
| | SATURN | W. | 34 31 41 | 2977 | 36 2 23 | 2966 | 37 33 18 | 2955 | 39 4 27 | 2945 |
| | Antares | E. | 54 0 0 | 2971 | 52 29 11 | 2962 | 50 58 11 | 2954 | 49 27 1 | 2945 |
| | α Aquilæ | E. | 101 16 32 | 2778 | 100 1 7 | 2762 | 98 45 25 | 2746 | 97 29 26 | 2739 |
| 20 | Pollux | W. | 95 0 35 | 2877 | 96 33 23 | 2866 | 98 6 25 | 2855 | 99 39 41 | 2845 |
| | Regulus | W. | 58 51 28 | 2892 | 60 23 57 | 2880 | 61 56 41 | 2869 | 63 29 40 | 2858 |
| | SATURN | W. | 46 43 37 | 2889 | 48 16 10 | 2878 | 49 48 57 | 2866 | 51 21 59 | 2855 |
| | Antares | E. | 41 48 19 | 2900 | 40 16 0 | 2891 | 38 43 30 | 2882 | 37 10 48 | 2873 |
| | α Aquilæ | E. | 91 5 41 | 2664 | 89 48 16 | 2654 | 88 30 40 | 2644 | 87 12 53 | 2635 |
| 21 | Pollux | W. | 107 29 38 | 2788 | 109 4 22 | 2777 | 110 39 20 | 2766 | 112 14 33 | 2753 |
| | Regulus | W. | 71 18 18 | 2798 | 72 52 48 | 2787 | 74 27 33 | 2775 | 76 2 33 | 2763 |
| | SATURN | W. | 59 10 51 | 2797 | 60 45 23 | 2785 | 62 20 11 | 2773 | 63 55 14 | 2762 |
| | Antares | E. | 29 24 39 | 2835 | 27 50 57 | 2822 | 26 17 7 | 2825 | 24 43 12 | 2822 |
| | α Aquilæ | E. | 80 41 52 | 2805 | 79 23 23 | 2801 | 78 4 50 | 2599 | 76 46 15 | 2599 |
| | Fomalhaut | E. | 111 58 25 | 2977 | 110 27 44 | 2969 | 108 56 43 | 2946 | 107 25 23 | 2931 |
| 22 | Regulus | W. | 84 1 27 | 2705 | 85 38 0 | 2693 | 87 14 49 | 2683 | 88 51 52 | 2671 |
| | SATURN | W. | 71 54 20 | 2703 | 73 30 56 | 2692 | 75 7 47 | 2681 | 76 44 53 | 2669 |
| | Spica | W. | 30 11 26 | 2771 | 31 46 32 | 2752 | 33 22 3 | 2735 | 34 57 57 | 2719 |
| | α Aquilæ | E. | 70 13 45 | 2619 | 68 55 31 | 2622 | 67 37 28 | 2640 | 66 19 37 | 2653 |
| | Fomalhaut | E. | 99 44 10 | 2862 | 98 11 3 | 2850 | 96 37 40 | 2838 | 95 4 1 | 2825 |

| GREENWICH MEAN TIME. | | | | | | | | | |
|----------------------|-------------------------------|-------------|----------------|------------|----------------|-------------|----------------|-------------|----------------|
| LUNAR DISTANCES. | | | | | | | | | |
| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
| 23 | Regulus W. | 90° 29' 11" | 9660 | 92° 6' 45" | 9649 | 93° 44' 33" | 9638 | 95° 22' 36" | 9627 |
| | SATURN W. | 78 22 14 | 9658 | 79 59 50 | 9647 | 81 37 41 | 9636 | 83 15 47 | 9626 |
| | Spica W. | 36 34 12 | 9703 | 38 10 48 | 9687 | 39 47 45 | 9673 | 41 25 1 | 9659 |
| | α Aquilæ E. | 65 2 0 | 9669 | 63 44 40 | 9688 | 62 27 40 | 9709 | 61 11 3 | 9733 |
| | Fomalhaut E. | 93 30 6 | 9614 | 91 55 56 | 9692 | 90 21 31 | 9791 | 88 46 51 | 9781 |
| 24 | Regulus W. | 103 36 27 | 9777 | 105 15 54 | 9666 | 106 55 35 | 9557 | 108 35 29 | 9548 |
| | Spica W. | 49 35 53 | 9596 | 51 14 54 | 9584 | 52 54 11 | 9573 | 54 33 43 | 9562 |
| | α Aquilæ E. | 54 55 33 | 9913 | 53 42 26 | 9963 | 52 30 10 | 4019 | 51 18 49 | 4081 |
| | Fomalhaut E. | 80 50 16 | 9734 | 79 14 21 | 9796 | 77 38 16 | 9719 | 76 2 1 | 9711 |
| | α Pegasi E. | 99 40 28 | 9960 | 98 9 50 | 9966 | 96 38 55 | 9954 | 95 7 44 | 9942 |
| 25 | Spica W. | 62 55 1 | 9512 | 64 35 58 | 9503 | 66 17 7 | 9494 | 67 58 28 | 9485 |
| | Antares W. | 17 13 40 | 9616 | 18 52 13 | 9586 | 20 31 27 | 9561 | 22 11 15 | 9541 |
| | Fomalhaut E. | 67 58 40 | 9686 | 66 21 41 | 9683 | 64 44 37 | 9689 | 63 7 30 | 9678 |
| | α Pegasi E. | 87 28 27 | 9685 | 85 56 2 | 9689 | 84 23 29 | 9683 | 82 50 49 | 9678 |
| 26 | Spica W. | 76 28 11 | 9441 | 78 10 40 | 9438 | 79 53 20 | 9432 | 81 36 9 | 9425 |
| | Antares W. | 30 36 18 | 9469 | 32 18 15 | 9458 | 34 0 28 | 9448 | 35 42 55 | 9438 |
| | Fomalhaut E. | 55 1 46 | 9685 | 53 24 46 | 9690 | 51 47 53 | 9697 | 50 11 9 | 9705 |
| | α Pegasi E. | 75 6 16 | 9668 | 73 33 16 | 9669 | 72 0 18 | 9671 | 70 27 22 | 9675 |
| 27 | Spica W. | 90 12 31 | 9396 | 91 56 12 | 9390 | 93 40 1 | 9385 | 95 23 57 | 9381 |
| | Antares W. | 44 18 16 | 9398 | 46 1 53 | 9392 | 47 45 39 | 9385 | 49 29 35 | 9380 |
| | Fomalhaut E. | 42 11 9 | 9781 | 40 36 16 | 9805 | 39 1 55 | 9834 | 37 28 11 | 9868 |
| | α Pegasi E. | 62 44 26 | 9314 | 61 12 25 | 9297 | 59 40 41 | 9292 | 58 9 16 | 9269 |
| | α Arietis E. | 103 54 49 | 9485 | 102 13 14 | 9478 | 100 31 30 | 9472 | 98 49 37 | 9465 |
| | SUN E. | 133 4 39 | 9684 | 131 27 37 | 9678 | 129 50 28 | 9672 | 128 13 11 | 9668 |
| 28 | Spica W. | 104 5 14 | 9359 | 105 49 47 | 9355 | 107 34 26 | 9352 | 109 19 10 | 9349 |
| | Antares W. | 58 11 15 | 9353 | 59 55 57 | 9348 | 61 40 46 | 9344 | 63 25 41 | 9339 |
| | α Pegasi E. | 50 38 42 | 9089 | 49 10 19 | 9197 | 47 42 42 | 9168 | 46 15 55 | 9216 |
| | α Arietis E. | 90 18 14 | 9441 | 88 35 37 | 9437 | 86 52 55 | 9433 | 85 10 8 | 9431 |
| | VENUS E. | 90 13 59 | 9734 | 88 37 51 | 9720 | 87 1 38 | 9716 | 85 25 19 | 9712 |
| | SUN E. | 120 5 4 | 9643 | 118 27 7 | 9639 | 116 49 5 | 9635 | 115 10 57 | 9631 |
| 29 | Antares W. | 72 11 43 | 9292 | 73 57 10 | 9319 | 75 42 42 | 9316 | 77 28 18 | 9313 |
| | α Arietis E. | 76 35 16 | 9420 | 74 52 10 | 9419 | 73 9 2 | 9418 | 71 25 53 | 9418 |
| | VENUS E. | 77 22 29 | 9694 | 75 45 41 | 9691 | 74 8 49 | 9687 | 72 31 52 | 9685 |
| | SUN E. | 106 59 1 | 9613 | 105 20 24 | 9610 | 103 41 42 | 9607 | 102 2 56 | 9604 |
| 30 | Antares W. | 86 17 18 | 9201 | 88 3 16 | 9200 | 89 49 16 | 9298 | 91 35 19 | 9296 |
| | α Aquilæ W. | 48 0 44 | 9992 | 49 12 31 | 9899 | 50 25 52 | 9816 | 51 40 38 | 9739 |
| | α Arietis E. | 62 50 18 | 9494 | 61 7 17 | 9497 | 59 24 21 | 9430 | 57 41 29 | 9434 |
| | VENUS E. | 64 26 17 | 9672 | 62 49 0 | 9671 | 61 11 41 | 9669 | 59 34 19 | 9667 |
| | SUN E. | 93 48 14 | 9592 | 92 9 8 | 9590 | 90 29 59 | 9588 | 88 50 48 | 9587 |
| 31 | Antares W. | 100 26 3 | 9291 | 102 12 16 | 9290 | 103 58 30 | 9290 | 105 44 44 | 9289 |
| | α Aquilæ W. | 58 12 24 | 9451 | 59 33 43 | 9408 | 60 55 51 | 9368 | 62 18 44 | 9333 |
| | α Arietis E. | 49 9 4 | 9469 | 47 27 7 | 9480 | 45 45 25 | 9491 | 44 3 59 | 9505 |
| | VENUS E. | 51 27 0 | 9661 | 49 49 28 | 9660 | 48 11 54 | 9659 | 46 34 19 | 9659 |
| | SUN E. | 80 34 22 | 9580 | 78 55 0 | 9580 | 77 15 37 | 9579 | 75 36 13 | 9578 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|----|------------|----------------|-------------|----------------|--------------|----------------|--------------|----------------|
| 23 | Regulus | W. | 97° 0' 54" | 2617 | 98° 39' 26" | 2606 | 100° 18' 13" | 2596 | 101° 57' 13" | 2586 |
| | SATURN | W. | 84 54 7 | 2615 | 86 32 42 | 2601 | 88 11 31 | 2593 | 89 50 35 | 2583 |
| | Spica | W. | 43 2 36 | 2546 | 44 40 29 | 2632 | 46 18 40 | 2620 | 47 57 8 | 2607 |
| | α Aquilæ | E. | 59 51 51 | 3762 | 58 39 9 | 3792 | 57 23 59 | 3828 | 56 9 26 | 3867 |
| | Fomalhaut | E. | 87 11 58 | 2770 | 85 36 51 | 2761 | 84 1 32 | 2751 | 82 26 0 | 2742 |
| 24 | Regulus | W. | 110 15 36 | 2539 | 111 55 55 | 2530 | 113 36 27 | 2522 | 115 17 10 | 2513 |
| | Spica | W. | 56 13 30 | 2551 | 57 53 32 | 2541 | 59 33 48 | 2531 | 61 14 18 | 2522 |
| | α Aquilæ | E. | 50 8 29 | 4152 | 48 59 17 | 4220 | 47 51 19 | 4318 | 46 44 43 | 4415 |
| | Fomalhaut | E. | 74 25 36 | 2705 | 72 49 3 | 2699 | 71 12 22 | 2694 | 69 35 34 | 2689 |
| | α Pegasi | E. | 93 36 18 | 2831 | 92 4 38 | 2921 | 90 32 46 | 2912 | 89 0 42 | 2903 |
| 25 | Spica | W. | 69 40 2 | 2477 | 71 21 47 | 2469 | 73 3 44 | 2461 | 74 45 52 | 2453 |
| | Antares | W. | 23 51 31 | 2523 | 25 32 12 | 2507 | 27 13 15 | 2494 | 28 54 37 | 2480 |
| | Fomalhaut | E. | 61 30 20 | 2677 | 59 53 9 | 2678 | 58 15 59 | 2679 | 56 38 51 | 2681 |
| | α Pegasi | E. | 81 18 2 | 2874 | 79 45 10 | 2871 | 78 12 14 | 2869 | 76 39 16 | 2868 |
| 26 | Spica | W. | 83 19 8 | 2419 | 85 2 16 | 2412 | 86 45 33 | 2407 | 88 28 58 | 2401 |
| | Antares | W. | 37 25 36 | 2429 | 39 8 29 | 2421 | 40 51 34 | 2413 | 42 34 50 | 2406 |
| | Fomalhaut | E. | 48 34 36 | 2715 | 46 58 16 | 2728 | 45 22 13 | 2743 | 43 46 30 | 2760 |
| | α Pegasi | E. | 68 54 31 | 2880 | 67 21 46 | 2935 | 65 49 8 | 2994 | 64 16 41 | 2993 |
| 27 | Spica | W. | 97 7 59 | 2376 | 98 52 8 | 2371 | 100 36 24 | 2367 | 102 20 46 | 2363 |
| | Antares | W. | 51 13 39 | 2373 | 52 57 52 | 2368 | 54 42 12 | 2363 | 56 26 40 | 2358 |
| | Fomalhaut | E. | 35 55 11 | 2908 | 34 23 2 | 2954 | 32 51 52 | 3011 | 31 21 53 | 3078 |
| | α Pegasi | E. | 56 38 12 | 2979 | 55 7 33 | 3002 | 53 37 23 | 3028 | 52 7 45 | 3056 |
| | α Arietis | E. | 97 7 35 | 2460 | 95 25 26 | 2455 | 93 43 9 | 2450 | 92 0 45 | 2445 |
| | SUN | E. | 126 35 48 | 2662 | 124 58 17 | 2657 | 123 20 39 | 2652 | 121 42 55 | 2647 |
| 28 | Spica | W. | 111 3 58 | 2346 | 112 48 50 | 2343 | 114 33 47 | 2341 | 116 18 47 | 2338 |
| | Antares | W. | 65 10 43 | 2336 | 66 55 50 | 2332 | 68 41 3 | 2328 | 70 26 21 | 2326 |
| | α Pegasi | E. | 44 50 5 | 3270 | 43 25 18 | 3330 | 42 1 41 | 3399 | 40 39 23 | 3477 |
| | α Arietis | E. | 83 27 17 | 2428 | 81 44 22 | 2425 | 80 1 23 | 2423 | 78 18 21 | 2421 |
| | VENUS | E. | 83 48 55 | 2708 | 82 12 26 | 2704 | 80 35 52 | 2701 | 78 59 13 | 2697 |
| | SUN | E. | 113 32 44 | 2646 | 111 54 25 | 2624 | 110 16 2 | 2620 | 108 37 34 | 2616 |
| 29 | Antares | W. | 79 13 59 | 2310 | 80 59 44 | 2308 | 82 45 32 | 2306 | 84 31 23 | 2303 |
| | α Arietis | E. | 69 42 44 | 2419 | 67 59 36 | 2419 | 66 16 28 | 2420 | 64 33 22 | 2422 |
| | VENUS | E. | 70 54 52 | 2692 | 69 17 48 | 2680 | 67 40 41 | 2678 | 66 3 31 | 2675 |
| | SUN | E. | 100 24 7 | 2601 | 98 45 14 | 2599 | 97 6 17 | 2596 | 95 27 17 | 2594 |
| 30 | Antares | W. | 93 21 24 | 2295 | 95 7 31 | 2294 | 96 53 40 | 2292 | 98 39 51 | 2291 |
| | α Aquilæ | W. | 52 56 44 | 3671 | 54 14 2 | 3608 | 55 32 28 | 3550 | 56 51 57 | 3497 |
| | α Arietis | E. | 55 58 43 | 2439 | 54 16 4 | 2445 | 52 33 34 | 2452 | 50 51 13 | 2460 |
| | VENUS | E. | 57 56 55 | 2666 | 56 19 29 | 2661 | 54 42 1 | 2663 | 53 4 31 | 2662 |
| | SUN | E. | 87 11 35 | 2585 | 85 32 19 | 2581 | 83 53 2 | 2583 | 82 13 43 | 2581 |
| 31 | Antares | W. | 107 30 59 | 2289 | 109 17 14 | 2290 | 111 3 28 | 2290 | 112 49 42 | 2291 |
| | α Aquilæ | W. | 63 42 17 | 3300 | 65 6 28 | 3371 | 66 31 13 | 3244 | 67 56 30 | 3220 |
| | α Arietis | E. | 42 22 53 | 2521 | 40 42 9 | 2539 | 39 1 50 | 2561 | 37 22 1 | 2565 |
| | VENUS | E. | 44 56 44 | 2659 | 43 19 9 | 2658 | 41 41 33 | 2658 | 40 3 57 | 2659 |
| | SUN | E. | 73 56 48 | 2578 | 72 17 23 | 2578 | 70 37 58 | 2578 | 68 58 33 | 2579 |

AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | | Sidereal Time of Semi-diameter Passing Meridian. | Equation of Time, to be Subtracted from | Diff. for 1 Hour. |
|------------------|-------------------|---------------------------|-------------------|-----------------------|-------------------|----------------|-------------------------|--|---|-------------------|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | Semi-diameter. | Added to Apparent Time. | | | |
| | | | | | | | | | | |
| Mon. | 1 | 4 36 16.68 | 10.231 | N.22 3 34.2 | +20.43 | 15 48.35 | 68.41 | 2 26.67 | 0.373 | |
| Tues. | 2 | 4 40 22.45 | 10.248 | 22 11 33.1 | 19.47 | 15 48.21 | 68.47 | 2 17.48 | 0.390 | |
| Wed. | 3 | 4 44 28.63 | 10.265 | 22 19 8.8 | 18.50 | 15 48.07 | 68.52 | 2 7.89 | 0.407 | |
| Thur. | 4 | 4 48 35.18 | 10.280 | 22 26 21.2 | +17.52 | 15 47.94 | 68.57 | 1 57.93 | 0.422 | |
| Frid. | 5 | 4 52 42 10 | 10.294 | 22 33 10.1 | 16 51 | 15 47.82 | 68.62 | 1 47.60 | 0.436 | |
| Sat. | 6 | 4 56 49.35 | 10.308 | 22 39 35.4 | 15.55 | 15 47.70 | 68.66 | 1 36.93 | 0.450 | |
| SUN. | 7 | 5 0 56.92 | 10.321 | 22 45 36.8 | +14.56 | 15 47.58 | 68.70 | 1 25 95 | 0.462 | |
| Mon. | 8 | 5 5 4.78 | 10.332 | 22 51 11.3 | 13.56 | 15 47.47 | 68.74 | 1 14.68 | 0.474 | |
| Tues. | 9 | 5 9 12.92 | 10.343 | 22 56 27.6 | 12.55 | 15 47.37 | 68.78 | 1 3.14 | 0.485 | |
| Wed. | 10 | 5 13 21.29 | 10.353 | 23 1 16.7 | +11.54 | 15 47.27 | 68.82 | 0 51.36 | 0.495 | |
| Thur. | 11 | 5 17 29.88 | 10.362 | 23 5 41.5 | 10.52 | 15 47.17 | 68.85 | 0 39.36 | 0.504 | |
| Frid. | 12 | 5 21 38.66 | 10.369 | 23 9 41.8 | 9.50 | 15 47.08 | 68.88 | 0 27.17 | 0.511 | |
| Sat. | 13 | 5 25 47.62 | 10.375 | 23 13 17.6 | + 8.48 | 15 47.00 | 68.90 | 0 14.80 | 0.518 | |
| SUN. | 14 | 5 29 56.72 | 10.381 | 23 16 28.8 | 7.45 | 15 46.92 | 68.92 | 0 2.30 | 0.523 | |
| Mon. | 15 | 5 34 5.93 | 10.386 | 23 19 15.3 | 6.42 | 15 46.85 | 68.94 | 0 10.32 | 0.528 | |
| Tues. | 16 | 5 38 15.24 | 10.389 | 23 21 37.1 | + 5.39 | 15 46.78 | 68.96 | 0 23.05 | 0.532 | |
| Wed. | 17 | 5 42 24.64 | 10.392 | 23 23 34.2 | 4.36 | 15 46.71 | 68.97 | 0 35.86 | 0.534 | |
| Thur. | 18 | 5 46 34.09 | 10.394 | 23 25 6.5 | 3.33 | 15 46.64 | 68.98 | 0 48.72 | 0.536 | |
| Frid. | 19 | 5 50 43.59 | 10.395 | 23 26 14.1 | + 2.29 | 15 46.58 | 68.98 | 1 1.62 | 0.537 | |
| Sat. | 20 | 5 54 53.10 | 10.395 | 23 26 56.9 | 1.26 | 15 46.52 | 68.98 | 1 14.53 | 0.537 | |
| SUN. | 21 | 5 59 2.60 | 10.395 | 23 27 14.9 | + 0.23 | 15 46.47 | 68.98 | 1 27.43 | 0.537 | |
| Mon. | 22 | 6 3 12.07 | 10.394 | 23 27 8.1 | - 0.80 | 15 46.42 | 68.98 | 1 40.31 | 0.536 | |
| Tues. | 23 | 6 7 21.51 | 10.391 | 23 26 36.5 | 1.83 | 15 46.37 | 68.97 | 1 53.16 | 0.534 | |
| Wed. | 24 | 6 11 30.89 | 10.388 | 23 25 40.1 | 2.86 | 15 46.33 | 68.96 | 2 5.95 | 0.532 | |
| Thur. | 25 | 6 15 40.19 | 10.384 | 23 24 19.1 | - 3.89 | 15 46.30 | 68.94 | 2 18.65 | 0.528 | |
| Frid. | 26 | 6 19 49.38 | 10.380 | 23 22 33.5 | 4.92 | 15 46.26 | 68.92 | 2 31.24 | 0.523 | |
| Sat. | 27 | 6 23 58.44 | 10.375 | 23 20 23.2 | 5.94 | 15 46.22 | 68.90 | 2 43.71 | 0.518 | |
| SUN. | 28 | 6 28 7.36 | 10.368 | 23 17 48.4 | - 6.96 | 15 46.19 | 68.88 | 2 56.04 | 0.511 | |
| Mon. | 29 | 6 32 16.12 | 10.361 | 23 14 49.0 | 7.98 | 15 46.16 | 68.85 | 3 8.22 | 0.504 | |
| Tues. | 30 | 6 36 24.69 | 10.352 | 23 11 25.1 | 9.00 | 15 46.14 | 68.82 | 3 20.20 | 0.495 | |
| Wed. | 31 | 6 40 33.06 | 10.343 | N.23 7 36.8 | -10.01 | 15 46.12 | 68.79 | 3 31.97 | 0.485 | |

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.19 from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign — indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

| AT GREENWICH MEAN NOON. | | | | | | | | | |
|-------------------------|-------------------|---|-------------------|-----------------------|-------------------|-----------------------------------|--------------------|---|--|
| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, to be Added to | | Diff. for 1 Hour. | Sidereal Time, or Right Ascension of Mean Sun. |
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | Subtracted from Mean Time. | | | |
| | | | | | | | | | |
| Mon. | 1 | ^h 4 ^m 36 ^s 17.10 | 10.230 | N. 22° 3' 35.0" | +20.43 | ^m 2 ^s 26.66 | ^s 0.373 | ^h 4 ^m 38 ^s 43.76 | |
| Tues. | 2 | 4 40 22.85 | 10.247 | 22 11 33.8 | 19.47 | 2 17.47 | 0.390 | 4 42 40.32 | |
| Wed. | 3 | 4 44 29.00 | 10.264 | 22 19 9.4 | 18.50 | 2 7.88 | 0.407 | 4 46 36.88 | |
| Thur. | 4 | 4 48 35.52 | 10.279 | 22 26 21.8 | +17.52 | 1 57.92 | 0.422 | 4 50 33.44 | |
| Frid. | 5 | 4 52 42.40 | 10.294 | 22 33 10.6 | 16.54 | 1 47.59 | 0.436 | 4 54 29.99 | |
| Sat. | 6 | 4 56 49.63 | 10.307 | 22 39 35.8 | 15.55 | 1 36.92 | 0.450 | 4 58 26.55 | |
| SUN. | 7 | 5 0 57.17 | 10.320 | 22 45 37.1 | +14.56 | 1 25.94 | 0.462 | 5 2 23.11 | |
| Mon. | 8 | 5 5 5.00 | 10.331 | 22 51 14.5 | 13.56 | 1 14.67 | 0.474 | 5 6 19.67 | |
| Tues. | 9 | 5 9 13.10 | 10.342 | 22 56 27.8 | 12.55 | 1 3.13 | 0.485 | 5 10 16.23 | |
| Wed. | 10 | 5 13 21.43 | 10.352 | 23 1 16.8 | +11.54 | 0 51.35 | 0.495 | 5 14 12.78 | |
| Thur. | 11 | 5 17 29.99 | 10.361 | 23 5 41.5 | 10.52 | 0 39.35 | 0.504 | 5 18 9.34 | |
| Frid. | 12 | 5 21 38.74 | 10.368 | 23 9 41.8 | 9.50 | 0 27.16 | 0.511 | 5 22 5.90 | |
| Sat. | 13 | 5 25 47.66 | 10.375 | 23 13 17.6 | + 8.48 | 0 14.80 | 0.518 | 5 26 2.46 | |
| SUN. | 14 | 5 29 56.72 | 10.380 | 23 16 28.8 | 7.45 | 0 2.30 | 0.523 | 5 29 59.02 | |
| Mon. | 15 | 5 34 5.90 | 10.385 | 23 19 15.3 | 6.42 | 0 10.32 | 0.528 | 5 33 55.58 | |
| Tues. | 16 | 5 38 15.18 | 10.388 | 23 21 37.1 | + 5.39 | 0 23.04 | 0.532 | 5 37 52.14 | |
| Wed. | 17 | 5 42 24.54 | 10.391 | 23 23 34.2 | 4.36 | 0 35.85 | 0.534 | 5 41 48.69 | |
| Thur. | 18 | 5 46 33.96 | 10.393 | 23 25 6.5 | 3.33 | 0 48.71 | 0.536 | 5 45 45.25 | |
| Frid. | 19 | 5 50 43.42 | 10.394 | 23 26 14.1 | + 2.29 | 1 1.61 | 0.537 | 5 49 41.81 | |
| Sat. | 20 | 5 54 52.89 | 10.394 | 23 26 56.9 | 1.26 | 1 14.52 | 0.537 | 5 53 38.37 | |
| SUN. | 21 | 5 59 2.35 | 10.394 | 23 27 14.9 | + 0.23 | 1 27.42 | 0.537 | 5 57 34.93 | |
| Mon. | 22 | 6 3 11.79 | 10.393 | 23 27 8.1 | - 0.80 | 1 40.30 | 0.536 | 6 1 31.49 | |
| Tues. | 23 | 6 7 21.19 | 10.391 | 23 26 36.6 | 1.83 | 1 53.15 | 0.534 | 6 5 28.04 | |
| Wed. | 24 | 6 11 30.53 | 10.388 | 23 25 40.3 | 2.86 | 2 5.93 | 0.532 | 6 9 24.60 | |
| Thur. | 25 | 6 15 39.79 | 10.384 | 23 24 19.3 | - 3.89 | 2 18.63 | 0.528 | 6 13 21.16 | |
| Frid. | 26 | 6 19 48.94 | 10.379 | 23 22 33.7 | 4.92 | 2 31.22 | 0.523 | 6 17 17.72 | |
| Sat. | 27 | 6 23 57.97 | 10.374 | 23 20 23.5 | 5.94 | 2 43.69 | 0.518 | 6 21 14.28 | |
| SUN. | 28 | 6 28 6.86 | 10.367 | 23 17 48.7 | - 6.96 | 2 56.02 | 0.511 | 6 25 10.81 | |
| Mon. | 29 | 6 32 15.59 | 10.360 | 23 14 49.4 | 7.98 | 3 8.19 | 0.504 | 6 29 7.40 | |
| Tues. | 30 | 6 36 24.12 | 10.351 | 23 11 25.6 | 9.00 | 3 20.17 | 0.495 | 6 33 3.95 | |
| Wed. | 31 | 6 40 32.45 | 10.342 | N. 23 7 37.4 | -10.01 | 3 31.94 | 0.485 | 6 37 0.51 | |

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign — indicates that north declinations are decreasing.

Diff. for 1 hour,
+ 9.8565
(Table III.)

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign — indicates that north declinations are decreasing.

Diff. for 1 hour,
+ 9.8565
(Table III.)

| AT GREENWICH MEAN NOON. | | | | | | | | |
|---|------------------|-----------------|------------|----------------------|-----------|--|----------------------|---|
| Day of the Month. | Day of the Year. | THE SUN'S | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 Hour. | Mean Time of Sidereal Noon. |
| | | TRUE LONGITUDE. | | Diff. for 1 Hour. | LATITUDE. | | | |
| | | λ | λ' | | | | | |
| 1 | 152 | 70° 40' 21.7 | 40' 17.2 | 143.68 | — 0.35 | 0.0062091 | +27.2 | 19 ^h 18 ^m 6.01 ^s |
| 2 | 153 | 71 37 49.8 | 37 45.1 | 143.65 | 0.27 | 0.0062734 | 26.3 | 19 14 10.10 |
| 3 | 154 | 72 35 17.2 | 35 12.3 | 143.62 | 0.17 | 0.0063355 | 25.4 | 19 10 14.18 |
| 4 | 155 | 73 32 43.8 | 32 38.7 | 143.59 | — 0.05 | 0.0063954 | +24.5 | 19 6 18.26 |
| 5 | 156 | 74 30 9.6 | 30 4.4 | 143.56 | + 0.08 | 0.0064530 | 23.5 | 19 2 22.35 |
| 6 | 157 | 75 27 34.6 | 27 29.2 | 143.53 | 0.21 | 0.0065081 | 22.5 | 18 58 26.44 |
| 7 | 158 | 76 24 58.8 | 24 53.2 | 143.49 | + 0.34 | 0.0065607 | +21.4 | 18 54 30.53 |
| 8 | 159 | 77 22 22.1 | 22 16.3 | 143.46 | 0.46 | 0.0066109 | 20.4 | 18 50 34.61 |
| 9 | 160 | 78 19 44.5 | 19 38.6 | 143.42 | 0.56 | 0.0066587 | 19.4 | 18 46 38.70 |
| 10 | 161 | 79 17 6.1 | 17 0.0 | 143.38 | + 0.64 | 0.0067040 | +18.4 | 18 42 42.79 |
| 11 | 162 | 80 14 26.8 | 14 20.5 | 143.34 | 0.70 | 0.0067469 | 17.4 | 18 38 46.87 |
| 12 | 163 | 81 11 46.5 | 11 40.0 | 143.30 | 0.73 | 0.0067875 | 16.5 | 18 34 50.95 |
| 13 | 164 | 82 9 5.3 | 8 58.6 | 143.26 | + 0.73 | 0.0068259 | +15.6 | 18 30 55.04 |
| 14 | 165 | 83 6 23.2 | 6 16.3 | 143.22 | 0.70 | 0.0068622 | 14.7 | 18 26 59.13 |
| 15 | 166 | 84 3 40.2 | 3 33.1 | 143.19 | 0.65 | 0.0068966 | 13.9 | 18 23 3.22 |
| 16 | 167 | 85 0 56.4 | 0 49.1 | 143.16 | + 0.56 | 0.0069291 | +13.2 | 18 19 7.30 |
| 17 | 168 | 85 58 11.8 | 58 4.3 | 143.13 | 0.45 | 0.0069599 | 12.5 | 18 15 11.39 |
| 18 | 169 | 86 55 26.5 | 55 18.8 | 143.10 | 0.33 | 0.0069891 | 11.8 | 18 11 15.48 |
| 19 | 170 | 87 52 40.5 | 52 32.6 | 143.07 | + 0.20 | 0.0070168 | +11.2 | 18 7 19.57 |
| 20 | 171 | 88 49 53.9 | 49 45.8 | 143.05 | + 0.07 | 0.0070430 | 10.6 | 18 3 23.65 |
| 21 | 172 | 89 47 6.8 | 46 58.5 | 143.03 | — 0.06 | 0.0070678 | 10.0 | 17 59 27.74 |
| 22 | 173 | 90 44 19.3 | 44 10.8 | 143.01 | — 0.18 | 0.0070912 | + 9.4 | 17 55 31.83 |
| 23 | 174 | 91 41 31.5 | 41 22.8 | 143.00 | 0.28 | 0.0071132 | 8.9 | 17 51 35.92 |
| 24 | 175 | 92 38 43.5 | 38 34.6 | 143.00 | 0.36 | 0.0071337 | 8.3 | 17 47 40.00 |
| 25 | 176 | 93 35 55.3 | 35 46.3 | 143.00 | — 0.41 | 0.0071527 | + 7.6 | 17 43 44.09 |
| 26 | 177 | 94 33 7.1 | 32 57.9 | 143.00 | 0.43 | 0.0071701 | 6.9 | 17 39 48.18 |
| 27 | 178 | 95 30 19.0 | 30 9.6 | 143.00 | 0.42 | 0.0071858 | 6.2 | 17 35 52.27 |
| 28 | 179 | 96 27 30.9 | 27 21.3 | 143.00 | — 0.37 | 0.0071997 | + 5.4 | 17 31 56.35 |
| 29 | 180 | 97 24 42.9 | 24 33.2 | 143.00 | 0.30 | 0.0072116 | 4.5 | 17 28 0.44 |
| 30 | 181 | 98 21 55.1 | 21 45.3 | 143.01 | 0.21 | 0.0072214 | 3.6 | 17 24 4.53 |
| 31 | 182 | 99 19 7.4 | 18 57.4 | 143.02 | — 0.10 | 0.0072289 | + 2.6 | 17 20 8.62 |
| NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 th . | | | | | | | | |
| | | | | | | | | Diff. for 1 Hour, — 9 ^h .8296. (Table II.) |

GREENWICH MEAN TIME.

THE MOON'S

| Day of the Month. | SEMIDIAMETER. | | HORIZONTAL PARALLAX. | | | | UPPER TRANSIT. | | AGE. |
|-------------------|---------------|-----------|----------------------|-------------------|-----------|-------------------|-----------------------------------|-------------------|-------------------|
| | Noon. | Midnight. | Noon. | Diff. for 1 Hour. | Midnight. | Diff. for 1 Hour. | Meridian of Greenwich. | Diff. for 1 Hour. | |
| | | | | | | | | | |
| 1 | 16' 11.7 | 16' 11.0 | 59' 19.5 | -0.16 | 59' 16.9 | -0.29 | ^h 20 ^m 21.2 | ^m 2.04 | ^d 24.2 |
| 2 | 16' 9.8 | 16' 8.2 | 59' 12.7 | 0.42 | 59' 6.9 | 0.56 | 21 10.3 | 2.07 | 25.2 |
| 3 | 16' 6.2 | 16' 3.6 | 58' 59.4 | 0.71 | 58' 50.0 | 0.86 | 22 0.6 | 2.14 | 26.2 |
| 4 | 16' 0.6 | 15' 57.1 | 58' 39.0 | -1.00 | 58' 26.2 | -1.14 | 22 53.1 | 2.23 | 27.2 |
| 5 | 15' 53.2 | 15' 48.9 | 58' 11.8 | 1.26 | 57' 56.0 | 1.37 | 23 47.6 | 2.30 | 28.2 |
| 6 | 15' 44.3 | 15' 39.4 | 57' 38.9 | 1.47 | 57' 20.9 | 1.54 | 6 | | 29.2 |
| 7 | 15' 34.3 | 15' 29.0 | 57' 2.1 | -1.59 | 56' 42.9 | -1.60 | 0 43.6 | 2.34 | 0.8 |
| 8 | 15' 23.7 | 15' 18.6 | 56' 23.7 | 1.60 | 56' 4.7 | 1.56 | 1 39.7 | 2.30 | 1.8 |
| 9 | 15' 13.6 | 15' 8.9 | 55' 46.3 | 1.50 | 55' 28.9 | 1.40 | 2 34.1 | 2.21 | 2.8 |
| 10 | 15' 4.5 | 15' 0.5 | 55' 12.7 | -1.29 | 54' 58.1 | -1.15 | 3 25.7 | 2.08 | 3.8 |
| 11 | 14' 57.0 | 14' 54.0 | 54' 45.2 | 0.99 | 54' 34.3 | 0.82 | 4 13.9 | 1.94 | 4.8 |
| 12 | 14' 51.7 | 14' 49.9 | 54' 25.7 | 0.63 | 54' 19.3 | 0.43 | 4 59.0 | 1.82 | 5.8 |
| 13 | 14' 48.9 | 14' 48.5 | 54' 15.5 | -0.22 | 54' 14.1 | -0.01 | 5 41.3 | 1.73 | 6.8 |
| 14 | 14' 48.9 | 14' 49.9 | 54' 15.4 | +0.22 | 54' 19.3 | +0.43 | 6 22.1 | 1.68 | 7.8 |
| 15 | 14' 51.7 | 14' 54.1 | 54' 25.7 | 0.64 | 54' 34.6 | 0.85 | 7 2.2 | 1.68 | 8.8 |
| 16 | 14' 57.2 | 15' 0.9 | 54' 45.9 | +1.01 | 54' 59.5 | +1.22 | 7 42.8 | 1.72 | 9.8 |
| 17 | 15' 5.1 | 15' 9.9 | 55' 15.1 | 1.38 | 55' 32.5 | 1.52 | 8 24.9 | 1.81 | 10.8 |
| 18 | 15' 15.0 | 15' 20.5 | 55' 51.4 | 1.63 | 56' 11.6 | 1.73 | 9 9.8 | 1.95 | 11.8 |
| 19 | 15' 26.2 | 15' 32.1 | 56' 32.7 | +1.78 | 56' 54.2 | +1.80 | 9 58.5 | 2.12 | 12.8 |
| 20 | 15' 38.0 | 15' 43.8 | 57' 15.8 | 1.79 | 57' 37.1 | 1.75 | 10 51.5 | 2.30 | 13.8 |
| 21 | 15' 49.4 | 15' 54.7 | 57' 57.7 | 1.67 | 58' 17.1 | 1.56 | 11 48.8 | 2.45 | 14.8 |
| 22 | 15' 59.5 | 16' 3.9 | 58' 35.0 | +1.42 | 58' 51.0 | +1.26 | 12 49.2 | 2.53 | 15.8 |
| 23 | 16' 7.7 | 16' 10.9 | 59' 5.0 | 1.08 | 59' 16.7 | 0.88 | 13 50.4 | 2.52 | 16.8 |
| 24 | 16' 13.4 | 16' 15.3 | 59' 25.9 | 0.67 | 59' 32.7 | 0.47 | 14 50.0 | 2.42 | 17.8 |
| 25 | 16' 16.4 | 16' 17.0 | 59' 37.0 | +0.37 | 59' 39.0 | +0.08 | 15 46.7 | 2.29 | 18.8 |
| 26 | 16' 16.9 | 16' 16.3 | 59' 38.8 | -0.11 | 59' 36.5 | -0.27 | 16 39.9 | 2.16 | 19.8 |
| 27 | 16' 15.2 | 16' 13.6 | 59' 32.4 | 0.41 | 59' 26.7 | 0.54 | 17 30.4 | 2.06 | 20.8 |
| 28 | 16' 11.7 | 16' 9.4 | 59' 19.5 | -0.65 | 59' 11.1 | -0.75 | 18 19.0 | 2.02 | 21.8 |
| 29 | 16' 6.8 | 16' 4.0 | 59' 1.7 | 0.83 | 58' 51.3 | 0.90 | 19 7.3 | 2.02 | 22.8 |
| 30 | 16' 0.9 | 15' 57.7 | 58' 40.1 | 0.96 | 58' 28.3 | 1.01 | 19 56.2 | 2.07 | 23.8 |
| 31 | 15' 54.3 | 15' 50.7 | 58' 15.8 | -1.07 | 58' 2.7 | -1.11 | 20 46.7 | 2.15 | 24.8 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|------------|---|---------------------|-----------------|---------------------|--------------|--|---------------------|-----------------|---------------------|
| MONDAY 1. | | | | | WEDNESDAY 3. | | | | |
| 0 | ^h 0 ^m 19 ^s 59.53 | 2.1385 | S. 2° 54' 51.0" | 15.527 | 0 | ^h 2 ^m 2 ^s 31.58 | 2.1670 | N. 9° 20' 56.5" | 14.581 |
| 1 | 0 22 7.45 | 2.1316 | 2 39 19.0 | 15.541 | 1 | 2 4 41.67 | 2.1693 | 9 35 29.7 | 14.596 |
| 2 | 0 24 15.32 | 2.1307 | 2 23 46.1 | 15.554 | 2 | 2 6 51.90 | 2.1717 | 9 49 59.6 | 14.470 |
| 3 | 0 26 23.13 | 2.1298 | 2 8 12.5 | 15.565 | 3 | 2 9 2.28 | 2.1742 | 10 4 26.1 | 14.412 |
| 4 | 0 28 30.89 | 2.1290 | 1 52 38.3 | 15.574 | 4 | 2 11 12.81 | 2.1767 | 10 18 49.1 | 14.353 |
| 5 | 0 30 38.61 | 2.1283 | 1 37 3.6 | 15.582 | 5 | 2 13 23.49 | 2.1792 | 10 33 8.5 | 14.293 |
| 6 | 0 32 46.29 | 2.1277 | 1 21 28.4 | 15.589 | 6 | 2 15 34.32 | 2.1818 | 10 47 24.3 | 14.232 |
| 7 | 0 34 53.94 | 2.1271 | 1 5 52.9 | 15.594 | 7 | 2 17 45.31 | 2.1845 | 11 1 36.3 | 14.168 |
| 8 | 0 37 1.55 | 2.1266 | 0 50 17.1 | 15.598 | 8 | 2 19 56.46 | 2.1872 | 11 15 44.4 | 14.103 |
| 9 | 0 39 9.13 | 2.1262 | 0 34 41.1 | 15.601 | 9 | 2 22 7.78 | 2.1900 | 11 29 48.6 | 14.037 |
| 10 | 0 41 16.69 | 2.1258 | 0 19 5.0 | 15.602 | 10 | 2 24 19.26 | 2.1928 | 11 43 48.8 | 13.969 |
| 11 | 0 43 24.23 | 2.1256 | S. 0 3 28.9 | 15.602 | 11 | 2 26 30.92 | 2.1957 | 11 57 44.9 | 13.901 |
| 12 | 0 45 31.76 | 2.1254 | N. 0 12 7.2 | 15.600 | 12 | 2 28 42.75 | 2.1986 | 12 11 36.9 | 13.831 |
| 13 | 0 47 39.28 | 2.1253 | 0 27 43.1 | 15.597 | 13 | 2 30 54.75 | 2.2015 | 12 25 24.7 | 13.759 |
| 14 | 0 49 46.80 | 2.1253 | 0 43 18.8 | 15.592 | 14 | 2 33 6.93 | 2.2045 | 12 39 8.0 | 13.684 |
| 15 | 0 51 54.32 | 2.1254 | 0 58 54.1 | 15.585 | 15 | 2 35 19.29 | 2.2075 | 12 52 46.8 | 13.609 |
| 16 | 0 54 1.85 | 2.1256 | 1 14 20.0 | 15.577 | 16 | 2 37 31.83 | 2.2106 | 13 6 21.1 | 13.534 |
| 17 | 0 56 9.39 | 2.1258 | 1 30 3.4 | 15.569 | 17 | 2 39 44.56 | 2.2137 | 13 19 50.9 | 13.457 |
| 18 | 0 58 16.94 | 2.1260 | 1 45 37.3 | 15.559 | 18 | 2 41 57.48 | 2.2168 | 13 33 16.0 | 13.378 |
| 19 | 1 0 24.51 | 2.1264 | 2 1 10.5 | 15.547 | 19 | 2 44 10.58 | 2.2199 | 13 46 36.3 | 13.298 |
| 20 | 1 2 32.11 | 2.1268 | 2 16 42.9 | 15.533 | 20 | 2 46 23.87 | 2.2232 | 13 59 51.8 | 13.217 |
| 21 | 1 4 39.73 | 2.1272 | 2 32 14.5 | 15.519 | 21 | 2 48 37.36 | 2.2264 | 14 13 2.3 | 13.133 |
| 22 | 1 6 47.38 | 2.1278 | 2 47 45.2 | 15.502 | 22 | 2 50 51.04 | 2.2297 | 14 26 7.8 | 13.049 |
| 23 | 1 8 55.07 | 2.1286 | N. 3 3 14.8 | 15.484 | 23 | 2 53 4.92 | 2.2329 | N. 14 39 8.2 | 12.963 |
| TUESDAY 2. | | | | | THURSDAY 4. | | | | |
| 0 | 1 11 2.81 | 2.1293 | N. 3 18 43.3 | 15.466 | 0 | 2 55 18.99 | 2.2362 | N. 14 52 3.4 | 12.877 |
| 1 | 1 13 10.59 | 2.1301 | 3 34 10.7 | 15.446 | 1 | 2 57 33.26 | 2.2395 | 15 4 53.4 | 12.788 |
| 2 | 1 15 18.42 | 2.1309 | 3 49 36.8 | 15.423 | 2 | 2 59 47.73 | 2.2429 | 15 17 38.0 | 12.698 |
| 3 | 1 17 26.30 | 2.1318 | 4 5 1.5 | 15.400 | 3 | 3 2 2.41 | 2.2463 | 15 30 17.2 | 12.607 |
| 4 | 1 19 34.24 | 2.1328 | 4 20 24.8 | 15.376 | 4 | 3 4 17.29 | 2.2497 | 15 42 50.9 | 12.515 |
| 5 | 1 21 42.24 | 2.1339 | 4 35 46.6 | 15.350 | 5 | 3 6 32.37 | 2.2531 | 15 55 19.0 | 12.421 |
| 6 | 1 23 50.31 | 2.1351 | 4 51 6.8 | 15.322 | 6 | 3 8 47.66 | 2.2565 | 16 7 41.4 | 12.326 |
| 7 | 1 25 58.45 | 2.1363 | 5 6 25.3 | 15.293 | 7 | 3 11 3.15 | 2.2599 | 16 19 58.1 | 12.230 |
| 8 | 1 28 6.67 | 2.1376 | 5 21 42.0 | 15.263 | 8 | 3 13 18.85 | 2.2634 | 16 32 9.0 | 12.132 |
| 9 | 1 30 14.97 | 2.1390 | 5 36 56.8 | 15.231 | 9 | 3 15 34.76 | 2.2669 | 16 44 13.9 | 12.032 |
| 10 | 1 32 23.35 | 2.1404 | 5 52 9.7 | 15.197 | 10 | 3 17 50.88 | 2.2704 | 16 56 12.8 | 11.932 |
| 11 | 1 34 31.82 | 2.1418 | 6 7 20.5 | 15.162 | 11 | 3 20 7.21 | 2.2738 | 17 8 5.7 | 11.831 |
| 12 | 1 36 40.37 | 2.1433 | 6 22 29.2 | 15.127 | 12 | 3 22 23.74 | 2.2773 | 17 19 5.5 | 11.728 |
| 13 | 1 38 49.02 | 2.1450 | 6 37 35.7 | 15.089 | 13 | 3 24 40.48 | 2.2808 | 17 31 33.0 | 11.623 |
| 14 | 1 40 57.77 | 2.1467 | 6 52 39.9 | 15.050 | 14 | 3 26 57.44 | 2.2844 | 17 43 7.2 | 11.518 |
| 15 | 1 43 6.63 | 2.1485 | 7 7 41.7 | 15.010 | 15 | 3 29 14.61 | 2.2879 | 17 54 35.1 | 11.412 |
| 16 | 1 45 15.59 | 2.1503 | 7 22 41.1 | 14.968 | 16 | 3 31 31.99 | 2.2913 | 18 5 56.6 | 11.304 |
| 17 | 1 47 24.66 | 2.1522 | 7 37 37.9 | 14.924 | 17 | 3 33 49.57 | 2.2947 | 18 17 11.6 | 11.195 |
| 18 | 1 49 33.85 | 2.1542 | 7 52 32.0 | 14.879 | 18 | 3 36 7.36 | 2.2982 | 18 28 20.0 | 11.084 |
| 19 | 1 51 43.16 | 2.1562 | 8 7 23.4 | 14.833 | 19 | 3 38 25.36 | 2.3017 | 18 39 21.7 | 10.972 |
| 20 | 1 53 52.59 | 2.1582 | 8 22 12.0 | 14.786 | 20 | 3 40 43.57 | 2.3052 | 18 50 16.7 | 10.859 |
| 21 | 1 56 2.14 | 2.1602 | 8 36 57.7 | 14.737 | 21 | 3 43 1.90 | 2.3087 | 19 1 4.8 | 10.744 |
| 22 | 1 58 11.82 | 2.1624 | 8 51 40.4 | 14.686 | 22 | 3 45 20.61 | 2.3121 | 19 11 46.0 | 10.622 |
| 23 | 2 0 21.63 | 2.1647 | 9 6 20.0 | 14.634 | 23 | 3 47 39.44 | 2.3155 | 19 22 20.3 | 10.513 |
| 24 | 2 2 31.58 | 2.1670 | N. 9 20 56.5 | 14.581 | 24 | 3 49 58.47 | 2.3189 | N. 19 32 47.6 | 10.396 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|------------------------|------------------|------------------------|-----------|------------------|------------------------|------------------|------------------------|
| FRIDAY 5. | | | | | SUNDAY 7. | | | | |
| 0 | h m s | " | N. 19° 32' 47.6" | 10.396 | 0 | h m s | " | N. 25° 18' 12.3" | 3.799 |
| 1 | 3 49 58.47 | 2.3189 | 19 43 7.8 | 10.377 | 1 | 5 46 46.54 | 2.4307 | 25 21 51.1 | 3.571 |
| 2 | 3 54 37.15 | 2.3257 | 19 53 20.9 | 10.157 | 2 | 5 49 11.79 | 2.4308 | 25 25 20.8 | 3.419 |
| 3 | 3 56 56.79 | 2.3290 | 20 3 26.7 | 10.036 | 3 | 5 51 37.04 | 2.4307 | 25 28 41.4 | 3.267 |
| 4 | 3 59 16.63 | 2.3323 | 20 13 25.2 | 9.914 | 4 | 5 54 2.28 | 2.4306 | 25 31 52.8 | 3.114 |
| 5 | 4 1 36.67 | 2.3356 | 20 23 16.4 | 9.791 | 5 | 5 56 27.51 | 2.4303 | 25 34 55.1 | 2.969 |
| 6 | 4 3 56.90 | 2.3388 | 20 33 0.1 | 9.666 | 6 | 5 58 52.71 | 2.4198 | 25 37 48.3 | 2.810 |
| 7 | 4 6 17.32 | 2.3420 | 20 42 36.3 | 9.541 | 7 | 6 1 17.89 | 2.4194 | 25 40 32.3 | 2.658 |
| 8 | 4 8 37.94 | 2.3452 | 20 52 5.0 | 9.415 | 8 | 6 3 43.04 | 2.4188 | 25 43 7.2 | 2.506 |
| 9 | 4 10 58.75 | 2.3484 | 21 1 26.1 | 9.287 | 9 | 6 6 8.15 | 2.4181 | 25 45 33.0 | 2.353 |
| 10 | 4 13 19.75 | 2.3515 | 21 10 39.5 | 9.159 | 10 | 6 8 33.21 | 2.4179 | 25 47 49.6 | 2.201 |
| 11 | 4 15 40.93 | 2.3545 | 21 19 45.2 | 9.030 | 11 | 6 10 58.21 | 2.4169 | 25 49 57.1 | 2.049 |
| 12 | 4 18 2.29 | 2.3575 | 21 28 43.1 | 8.900 | 12 | 6 13 23.15 | 2.4159 | 25 51 55.5 | 1.897 |
| 13 | 4 20 23.83 | 2.3605 | 21 37 33.2 | 8.768 | 13 | 6 15 48.03 | 2.4141 | 25 53 44.7 | 1.745 |
| 14 | 4 22 45.55 | 2.3634 | 21 46 15.3 | 8.635 | 14 | 6 18 12.84 | 2.4139 | 25 55 24.9 | 1.594 |
| 15 | 4 25 7.44 | 2.3662 | 21 54 49.4 | 8.502 | 15 | 6 20 37.58 | 2.4116 | 25 56 56.0 | 1.443 |
| 16 | 4 27 29.50 | 2.3691 | 22 3 15.5 | 8.368 | 16 | 6 23 2.23 | 2.4101 | 25 58 18.0 | 1.292 |
| 17 | 4 29 51.73 | 2.3719 | 22 11 33.6 | 8.234 | 17 | 6 25 26.79 | 2.4085 | 25 59 31.0 | 1.141 |
| 18 | 4 32 14.13 | 2.3746 | 22 19 43.6 | 8.098 | 18 | 6 27 51.25 | 2.4068 | 26 0 34.9 | 0.990 |
| 19 | 4 34 36.68 | 2.3772 | 22 27 45.4 | 7.961 | 19 | 6 30 15.61 | 2.4051 | 26 1 29.8 | 0.840 |
| 20 | 4 36 59.39 | 2.3798 | 22 35 38.9 | 7.823 | 20 | 6 32 39.86 | 2.4033 | 26 2 15.7 | 0.689 |
| 21 | 4 39 22.26 | 2.3824 | 22 43 24.1 | 7.684 | 21 | 6 35 3.99 | 2.4019 | 26 2 52.5 | 0.539 |
| 22 | 4 41 45.28 | 2.3848 | 22 51 1.0 | 7.546 | 22 | 6 37 28.00 | 2.3999 | 26 3 20.4 | 0.390 |
| 23 | 4 44 8.44 | 2.3872 | N. 22° 58' 29.6" | 7.407 | 23 | 6 39 51.89 | 2.3970 | N. 26° 3' 39.3" | 0.241 |
| SATURDAY 6. | | | | | MONDAY 8. | | | | |
| 0 | 4 46 31.74 | 2.3895 | N. 23° 5' 49.8" | 7.266 | 0 | 6 42 15.64 | 2.3947 | N. 26° 3' 49.3" | + 0.093 |
| 1 | 4 48 55.18 | 2.3918 | 23 13 1.5 | 7.124 | 1 | 6 44 39.25 | 2.3923 | 26 3 50.4 | - 0.055 |
| 2 | 4 51 18.75 | 2.3940 | 23 20 4.7 | 6.981 | 2 | 6 47 2.72 | 2.3898 | 26 3 42.7 | 0.002 |
| 3 | 4 53 42.46 | 2.3962 | 23 26 59.3 | 6.838 | 3 | 6 49 26.03 | 2.3872 | 26 3 26.1 | 0.350 |
| 4 | 4 56 6.29 | 2.3982 | 23 33 45.3 | 6.695 | 4 | 6 51 49.18 | 2.3845 | 26 3 0.7 | 0.497 |
| 5 | 4 58 30.24 | 2.4001 | 23 40 22.7 | 6.552 | 5 | 6 54 12.17 | 2.3818 | 26 2 26.5 | 0.643 |
| 6 | 5 0 54.30 | 2.4019 | 23 46 51.5 | 6.408 | 6 | 6 56 35.00 | 2.3790 | 26 1 43.5 | 0.789 |
| 7 | 5 3 18.47 | 2.4038 | 23 53 11.6 | 6.262 | 7 | 6 58 57.65 | 2.3760 | 26 0 51.8 | 0.934 |
| 8 | 5 5 42.75 | 2.4056 | 23 59 22.9 | 6.115 | 8 | 7 1 20.12 | 2.3739 | 25 59 51.4 | 1.078 |
| 9 | 5 8 7.14 | 2.4072 | 24 5 25.4 | 5.968 | 9 | 7 3 42.40 | 2.3698 | 25 58 42.4 | 1.222 |
| 10 | 5 10 31.62 | 2.4087 | 24 11 19.1 | 5.822 | 10 | 7 6 4.49 | 2.3666 | 25 57 24.8 | 1.365 |
| 11 | 5 12 56.19 | 2.4102 | 24 17 4.0 | 5.674 | 11 | 7 8 26.39 | 2.3633 | 25 55 58.6 | 1.508 |
| 12 | 5 15 20.84 | 2.4115 | 24 22 40.0 | 5.526 | 12 | 7 10 48.09 | 2.3599 | 25 54 23.8 | 1.651 |
| 13 | 5 17 45.57 | 2.4128 | 24 28 7.1 | 5.377 | 13 | 7 13 9.58 | 2.3564 | 25 52 40.5 | 1.792 |
| 14 | 5 20 10.38 | 2.4141 | 24 33 25.3 | 5.229 | 14 | 7 15 30.86 | 2.3528 | 25 50 48.8 | 1.932 |
| 15 | 5 22 35.26 | 2.4152 | 24 38 34.6 | 5.080 | 15 | 7 17 51.92 | 2.3492 | 25 48 48.7 | 2.072 |
| 16 | 5 25 0.20 | 2.4162 | 24 43 34.9 | 4.931 | 16 | 7 20 12.76 | 2.3454 | 25 46 40.2 | 2.211 |
| 17 | 5 27 25.20 | 2.4170 | 24 48 26.3 | 4.781 | 17 | 7 22 33.37 | 2.3416 | 25 44 23.4 | 2.350 |
| 18 | 5 29 50.24 | 2.4178 | 24 53 8.6 | 4.630 | 18 | 7 24 53.75 | 2.3377 | 25 41 58.2 | 2.488 |
| 19 | 5 32 15.33 | 2.4186 | 24 57 41.9 | 4.479 | 19 | 7 27 13.90 | 2.3337 | 25 39 24.8 | 2.625 |
| 20 | 5 34 40.47 | 2.4192 | 25 2 6.1 | 4.328 | 20 | 7 29 33.80 | 2.3297 | 25 36 43.2 | 2.761 |
| 21 | 5 37 5.64 | 2.4197 | 25 6 21.3 | 4.177 | 21 | 7 31 53.46 | 2.3256 | 25 33 53.5 | 2.896 |
| 22 | 5 39 30.83 | 2.4201 | 25 10 27.4 | 4.026 | 22 | 7 34 12.87 | 2.3214 | 25 30 55.7 | 3.031 |
| 23 | 5 41 56.05 | 2.4203 | 25 14 24.4 | 3.874 | 23 | 7 36 32.03 | 2.3172 | 25 27 49.8 | 3.165 |
| 24 | 5 44 21.29 | 2.4207 | N. 25° 18' 12.3" | 3.722 | 24 | 7 38 50.93 | 2.3128 | N. 25° 24' 35.9" | 3.298 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|---|---------------------|------------------|---------------------|--------------|--|---------------------|------------------|---------------------|
| TUESDAY 9. | | | | | THURSDAY 11. | | | | |
| 0 | ^h 7 ^m 38 ^s 50.93 | 2.3198 | N. 25° 24' 35.9" | 3.298 | 0 | ^h 9 ^m 24 ^s 5.70 | 2.0653 | N. 20° 30' 48.9" | 8.565 |
| 1 | 7 41 9.57 | 2.3084 | 25 21 14.0 | 3.431 | 1 | 9 26 9.46 | 2.0601 | 20 22 12.4 | 8.650 |
| 2 | 7 43 27.94 | 2.3040 | 25 17 44.2 | 3.569 | 2 | 9 28 12.91 | 2.0549 | 20 13 30.9 | 8.734 |
| 3 | 7 45 46.05 | 2.2996 | 25 14 6.6 | 3.691 | 3 | 9 30 16.05 | 2.0497 | 20 4 44.4 | 8.817 |
| 4 | 7 48 3.89 | 2.2950 | 25 10 21.3 | 3.820 | 4 | 9 32 18.87 | 2.0444 | 19 55 52.9 | 8.900 |
| 5 | 7 50 21.45 | 2.2903 | 25 6 28.2 | 3.950 | 5 | 9 34 21.38 | 2.0393 | 19 46 56.4 | 8.982 |
| 6 | 7 52 38.73 | 2.2856 | 25 2 27.3 | 4.078 | 6 | 9 36 23.59 | 2.0342 | 19 37 55.1 | 9.062 |
| 7 | 7 54 55.73 | 2.2809 | 24 58 18.8 | 4.205 | 7 | 9 38 25.49 | 2.0292 | 19 28 49.0 | 9.142 |
| 8 | 7 57 12.44 | 2.2762 | 24 54 2.7 | 4.331 | 8 | 9 40 27.09 | 2.0241 | 19 19 38.1 | 9.220 |
| 9 | 7 59 28.87 | 2.2713 | 24 49 39.1 | 4.456 | 9 | 9 42 28.38 | 2.0190 | 19 10 22.6 | 9.298 |
| 10 | 8 1 45.00 | 2.2664 | 24 45 8.0 | 4.580 | 10 | 9 44 29.37 | 2.0141 | 19 1 2.4 | 9.375 |
| 11 | 8 4 0.84 | 2.2616 | 24 40 29.5 | 4.703 | 11 | 9 46 30.07 | 2.0092 | 18 51 37.6 | 9.451 |
| 12 | 8 6 16.39 | 2.2567 | 24 35 43.6 | 4.826 | 12 | 9 48 30.47 | 2.0043 | 18 42 8.3 | 9.525 |
| 13 | 8 8 31.64 | 2.2518 | 24 30 50.4 | 4.947 | 13 | 9 50 30.58 | 1.9994 | 18 32 34.6 | 9.599 |
| 14 | 8 10 46.58 | 2.2468 | 24 25 50.0 | 5.067 | 14 | 9 52 30.40 | 1.9945 | 18 22 56.4 | 9.673 |
| 15 | 8 13 1.22 | 2.2414 | 24 20 42.4 | 5.187 | 15 | 9 54 29.92 | 1.9897 | 18 13 13.8 | 9.746 |
| 16 | 8 15 15.55 | 2.2363 | 24 15 27.6 | 5.305 | 16 | 9 56 29.16 | 1.9849 | 18 3 26.9 | 9.817 |
| 17 | 8 17 29.57 | 2.2312 | 24 10 5.8 | 5.422 | 17 | 9 58 28.11 | 1.9802 | 17 53 35.8 | 9.887 |
| 18 | 8 19 43.29 | 2.2261 | 24 4 37.0 | 5.538 | 18 | 10 0 26.78 | 1.9755 | 17 43 40.5 | 9.956 |
| 19 | 8 21 56.70 | 2.2208 | 23 59 1.2 | 5.654 | 19 | 10 2 25.17 | 1.9708 | 17 33 41.1 | 10.025 |
| 20 | 8 24 9.79 | 2.2155 | 23 53 18.5 | 5.768 | 20 | 10 4 23.28 | 1.9662 | 17 23 37.5 | 10.093 |
| 21 | 8 26 22.56 | 2.2102 | 23 47 29.0 | 5.882 | 21 | 10 6 21.12 | 1.9617 | 17 13 29.9 | 10.159 |
| 22 | 8 28 35.02 | 2.2050 | 23 41 32.7 | 5.994 | 22 | 10 8 18.69 | 1.9572 | 17 3 18.4 | 10.225 |
| 23 | 8 30 47.16 | 2.1997 | N. 23° 35' 29.7" | 6.105 | 23 | 10 10 15.99 | 1.9527 | N. 16° 53' 2.9" | 10.291 |
| WEDNESDAY 10. | | | | | FRIDAY 12. | | | | |
| 0 | 8 32 58.98 | 2.1943 | N. 23° 29' 20.1" | 6.215 | 0 | 10 12 13.02 | 1.9489 | N. 16° 42' 43.5" | 10.355 |
| 1 | 8 35 10.48 | 2.1890 | 23 23 3.9 | 6.325 | 1 | 10 14 9.78 | 1.9439 | 16 32 20.3 | 10.418 |
| 2 | 8 37 21.66 | 2.1836 | 23 16 41.1 | 6.434 | 2 | 10 16 6.29 | 1.9387 | 16 21 53.3 | 10.481 |
| 3 | 8 39 32.52 | 2.1782 | 23 10 11.8 | 6.542 | 3 | 10 18 2.54 | 1.9334 | 16 11 22.6 | 10.543 |
| 4 | 8 41 43.05 | 2.1728 | 23 3 36.1 | 6.648 | 4 | 10 19 58.54 | 1.9312 | 16 0 48.2 | 10.604 |
| 5 | 8 43 53.26 | 2.1675 | 22 56 54.0 | 6.753 | 5 | 10 21 54.29 | 1.9270 | 15 50 10.1 | 10.664 |
| 6 | 8 46 3.15 | 2.1621 | 22 50 5.7 | 6.857 | 6 | 10 23 49.78 | 1.9228 | 15 39 28.5 | 10.723 |
| 7 | 8 48 12.71 | 2.1567 | 22 43 11.2 | 6.960 | 7 | 10 25 45.03 | 1.9188 | 15 28 43.3 | 10.782 |
| 8 | 8 50 21.95 | 2.1512 | 22 36 10.5 | 7.063 | 8 | 10 27 40.04 | 1.9148 | 15 17 54.6 | 10.839 |
| 9 | 8 52 30.86 | 2.1458 | 22 29 3.6 | 7.165 | 9 | 10 29 34.81 | 1.9109 | 15 7 2.6 | 10.895 |
| 10 | 8 54 39.45 | 2.1404 | 22 21 50.7 | 7.265 | 10 | 10 31 29.35 | 1.9070 | 14 56 7.2 | 10.952 |
| 11 | 8 56 47.71 | 2.1350 | 22 14 31.8 | 7.364 | 11 | 10 33 23.65 | 1.9031 | 14 45 8.4 | 11.008 |
| 12 | 8 58 55.65 | 2.1296 | 22 7 7.0 | 7.462 | 12 | 10 35 17.72 | 1.8993 | 14 34 6.3 | 11.062 |
| 13 | 9 1 3.26 | 2.1242 | 21 59 36.3 | 7.560 | 13 | 10 37 11.57 | 1.8956 | 14 23 1.0 | 11.115 |
| 14 | 9 3 10.55 | 2.1187 | 21 51 59.8 | 7.656 | 14 | 10 39 5.20 | 1.8919 | 14 11 52.5 | 11.168 |
| 15 | 9 5 17.51 | 2.1133 | 21 44 17.6 | 7.751 | 15 | 10 40 58.60 | 1.8882 | 14 0 40.8 | 11.221 |
| 16 | 9 7 24.15 | 2.1080 | 21 36 29.7 | 7.845 | 16 | 10 42 51.79 | 1.8847 | 13 49 26.0 | 11.272 |
| 17 | 9 9 30.47 | 2.1026 | 21 28 36.2 | 7.938 | 17 | 10 44 44.77 | 1.8812 | 13 38 8.1 | 11.323 |
| 18 | 9 11 36.46 | 2.0972 | 21 20 37.1 | 8.031 | 18 | 10 46 37.54 | 1.8777 | 13 26 47.2 | 11.373 |
| 19 | 9 13 42.13 | 2.0918 | 21 12 32.5 | 8.122 | 19 | 10 48 30.10 | 1.8743 | 13 15 23.4 | 11.423 |
| 20 | 9 15 47.48 | 2.0865 | 21 4 22.4 | 8.212 | 20 | 10 50 22.46 | 1.8711 | 13 3 56.6 | 11.471 |
| 21 | 9 17 52.51 | 2.0812 | 20 56 7.0 | 8.301 | 21 | 10 52 14.63 | 1.8678 | 12 52 26.9 | 11.518 |
| 22 | 9 19 57.22 | 2.0759 | 20 47 46.3 | 8.390 | 22 | 10 54 6.60 | 1.8646 | 12 40 54.4 | 11.565 |
| 23 | 9 22 1.62 | 2.0706 | 20 39 20.2 | 8.478 | 23 | 10 55 58.38 | 1.8614 | 12 29 19.1 | 11.612 |
| 24 | 9 24 5.70 | 2.0653 | N. 20° 30' 48.9" | 8.565 | 24 | 10 57 49.97 | 1.8583 | N. 12° 17' 41.0" | 11.657 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|------------------------|---------------|------------------------|-------------|------------------|------------------------|--------------|------------------------|
| SATURDAY 13. | | | | | MONDAY 15. | | | | |
| 0 | 10 57 49.97 | 1.8583 | N. 12 17 41.0 | 11.657 | 0 | 12 24 43.10 | 1.7881 | N. 2 18 36.9 | 13.057 |
| 1 | 10 59 41.38 | 1.8553 | 12 6 0.2 | 11.709 | 1 | 12 26 30.39 | 1.7883 | 2 5 33.1 | 13.070 |
| 2 | 11 1 32.61 | 1.8523 | 11 54 16.8 | 11.745 | 2 | 12 28 17.70 | 1.7886 | 1 52 28.5 | 13.083 |
| 3 | 11 3 23.66 | 1.8494 | 11 42 30.8 | 11.788 | 3 | 12 30 5.03 | 1.7890 | 1 39 23.1 | 13.096 |
| 4 | 11 5 14.54 | 1.8466 | 11 30 42.2 | 11.831 | 4 | 12 31 52.38 | 1.7895 | 1 26 17.0 | 13.107 |
| 5 | 11 7 5.26 | 1.8439 | 11 18 51.0 | 11.874 | 5 | 12 33 39.77 | 1.7901 | 1 13 10.2 | 13.118 |
| 6 | 11 8 55.81 | 1.8412 | 11 6 57.3 | 11.915 | 6 | 12 35 27.19 | 1.7907 | 1 0 2.8 | 13.128 |
| 7 | 11 10 46.20 | 1.8385 | 10 55 1.2 | 11.955 | 7 | 12 37 14.65 | 1.7913 | 0 46 54.8 | 13.138 |
| 8 | 11 12 36.43 | 1.8359 | 10 43 2.7 | 11.996 | 8 | 12 39 2.15 | 1.7921 | 0 33 46.2 | 13.148 |
| 9 | 11 14 26.51 | 1.8334 | 10 31 1.8 | 12.035 | 9 | 12 40 49.70 | 1.7929 | 0 20 37.0 | 13.156 |
| 10 | 11 16 16.44 | 1.8309 | 10 18 58.5 | 12.073 | 10 | 12 42 37.30 | 1.7938 | N. 0 7 27.4 | 13.164 |
| 11 | 11 18 6.22 | 1.8285 | 10 6 53.0 | 12.110 | 11 | 12 44 24.96 | 1.7948 | S. 0 5 42.7 | 13.172 |
| 12 | 11 19 55.86 | 1.8262 | 9 54 45.3 | 12.147 | 12 | 12 46 12.68 | 1.7958 | 0 18 53.2 | 13.178 |
| 13 | 11 21 45.37 | 1.8240 | 9 42 35.4 | 12.183 | 13 | 12 48 0.46 | 1.7970 | 0 32 4.1 | 13.184 |
| 14 | 11 23 34.74 | 1.8218 | 9 30 23.3 | 12.220 | 14 | 12 49 48.32 | 1.7989 | 0 45 15.3 | 13.189 |
| 15 | 11 25 23.98 | 1.8197 | 9 18 9.0 | 12.256 | 15 | 12 51 36.25 | 1.7995 | 0 58 26.8 | 13.194 |
| 16 | 11 27 13.10 | 1.8177 | 9 5 52.6 | 12.290 | 16 | 12 53 24.26 | 1.8008 | 1 11 38.6 | 13.197 |
| 17 | 11 29 2.10 | 1.8156 | 8 53 34.2 | 12.324 | 17 | 12 55 12.35 | 1.8029 | 1 24 50.5 | 13.200 |
| 18 | 11 30 50.97 | 1.8136 | 8 41 13.8 | 12.357 | 18 | 12 57 0.52 | 1.8037 | 1 38 2.6 | 13.203 |
| 19 | 11 32 39.73 | 1.8118 | 8 28 51.4 | 12.389 | 19 | 12 58 48.79 | 1.8053 | 1 51 14.9 | 13.205 |
| 20 | 11 34 28.39 | 1.8101 | 8 16 27.1 | 12.421 | 20 | 13 0 37.16 | 1.8069 | 2 4 27.2 | 13.206 |
| 21 | 11 36 16.94 | 1.8084 | 8 4 0.9 | 12.452 | 21 | 13 2 25.62 | 1.8086 | 2 17 39.6 | 13.207 |
| 22 | 11 38 5.39 | 1.8067 | 7 51 32.8 | 12.483 | 22 | 13 4 14.19 | 1.8104 | 2 30 52.0 | 13.206 |
| 23 | 11 39 53.74 | 1.8051 | N. 7 39 2.9 | 12.513 | 23 | 13 6 2.87 | 1.8122 | S. 2 44 4.3 | 13.205 |
| SUNDAY 14. | | | | | TUESDAY 16. | | | | |
| 0 | 11 41 42.00 | 1.8036 | N. 7 26 31.3 | 12.549 | 0 | 13 7 51.66 | 1.8142 | S. 2 57 16.6 | 13.204 |
| 1 | 11 43 30.17 | 1.8022 | 7 13 57.9 | 12.571 | 1 | 13 9 40.57 | 1.8162 | 3 10 28.8 | 13.209 |
| 2 | 11 45 18.26 | 1.8007 | 7 1 22.8 | 12.598 | 2 | 13 11 29.60 | 1.8182 | 3 23 40.8 | 13.198 |
| 3 | 11 47 6.26 | 1.7994 | 6 48 46.1 | 12.626 | 3 | 13 13 18.76 | 1.8204 | 3 36 52.6 | 13.194 |
| 4 | 11 48 54.19 | 1.7982 | 6 36 7.7 | 12.653 | 4 | 13 15 8.05 | 1.8227 | 3 50 4.1 | 13.189 |
| 5 | 11 50 42.05 | 1.7970 | 6 23 27.7 | 12.679 | 5 | 13 16 57.48 | 1.8250 | 4 3 15.3 | 13.184 |
| 6 | 11 52 29.83 | 1.7958 | 6 10 46.2 | 12.704 | 6 | 13 18 47.05 | 1.8273 | 4 16 26.2 | 13.178 |
| 7 | 11 54 17.55 | 1.7948 | 5 58 3.2 | 12.729 | 7 | 13 20 36.76 | 1.8298 | 4 29 36.7 | 13.172 |
| 8 | 11 56 5.21 | 1.7939 | 5 45 18.7 | 12.754 | 8 | 13 22 26.63 | 1.8324 | 4 42 46.8 | 13.164 |
| 9 | 11 57 52.82 | 1.7931 | 5 32 32.7 | 12.777 | 9 | 13 24 16.65 | 1.8350 | 4 55 56.4 | 13.156 |
| 10 | 11 59 40.38 | 1.7922 | 5 19 45.4 | 12.800 | 10 | 13 26 6.83 | 1.8377 | 5 9 5.5 | 13.147 |
| 11 | 12 1 27.89 | 1.7914 | 5 6 56.7 | 12.822 | 11 | 13 27 57.17 | 1.8404 | 5 22 14.0 | 13.137 |
| 12 | 12 3 15.35 | 1.7908 | 4 54 6.7 | 12.844 | 12 | 13 29 47.67 | 1.8432 | 5 35 21.9 | 13.126 |
| 13 | 12 5 2.78 | 1.7903 | 4 41 15.4 | 12.865 | 13 | 13 31 38.35 | 1.8461 | 5 48 29.1 | 13.114 |
| 14 | 12 6 50.17 | 1.7896 | 4 28 22.9 | 12.886 | 14 | 13 33 29.21 | 1.8491 | 6 1 35.6 | 13.102 |
| 15 | 12 8 37.53 | 1.7891 | 4 15 29.1 | 12.906 | 15 | 13 35 20.24 | 1.8521 | 6 14 41.4 | 13.089 |
| 16 | 12 10 24.86 | 1.7887 | 4 2 34.2 | 12.925 | 16 | 13 37 11.46 | 1.8552 | 6 27 46.3 | 13.075 |
| 17 | 12 12 12.17 | 1.7884 | 3 49 38.1 | 12.944 | 17 | 13 39 2.87 | 1.8584 | 6 40 50.4 | 13.061 |
| 18 | 12 13 59.47 | 1.7882 | 3 36 40.9 | 12.962 | 18 | 13 40 54.47 | 1.8617 | 6 53 53.6 | 13.045 |
| 19 | 12 15 46.75 | 1.7879 | 3 23 42.7 | 12.979 | 19 | 13 42 46.27 | 1.8651 | 7 6 55.8 | 13.029 |
| 20 | 12 17 34.02 | 1.7878 | 3 10 43.5 | 12.996 | 20 | 13 44 38.28 | 1.8685 | 7 19 57.1 | 13.012 |
| 21 | 12 19 21.29 | 1.7877 | 2 57 43.2 | 13.012 | 21 | 13 46 30.49 | 1.8720 | 7 32 57.3 | 12.993 |
| 22 | 12 21 8.55 | 1.7877 | 2 44 42.0 | 13.027 | 22 | 13 48 22.92 | 1.8756 | 7 45 56.3 | 12.974 |
| 23 | 12 22 53.82 | 1.7879 | 2 31 39.9 | 13.042 | 23 | 13 50 15.56 | 1.8792 | 7 58 54.2 | 12.955 |
| 24 | 12 24 43.10 | 1.7881 | N. 2 18 36.9 | 13.057 | 24 | 13 52 8.42 | 1.8828 | S. 8 11 50.9 | 12.934 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|------------------|---------------------|---------------|---------------------|--------------|------------------|---------------------|---------------|---------------------|
| WEDNESDAY 17. | | | | | FRIDAY 19. | | | | |
| 0 | 13 52 8.42 | 1.8838 | S. 8 11 50.9 | 12.934 | 0 | 15 28 6.85 | 2.1400 | S. 17 49 50.1 | 10.713 |
| 1 | 13 54 1.50 | 1.8867 | 8 24 46.3 | 12.912 | 1 | 15 30 15.45 | 2.1467 | 18 0 30.6 | 10.637 |
| 2 | 13 55 54.82 | 1.8906 | 8 37 40.4 | 12.890 | 2 | 15 32 24.45 | 2.1534 | 18 11 6.5 | 10.559 |
| 3 | 13 57 48.37 | 1.8945 | 8 50 33.1 | 12.867 | 3 | 15 34 33.86 | 2.1602 | 18 21 37.7 | 10.480 |
| 4 | 13 59 42.16 | 1.8985 | 9 3 24.4 | 12.842 | 4 | 15 36 43.68 | 2.1671 | 18 32 4.1 | 10.400 |
| 5 | 14 1 36.19 | 1.9026 | 9 16 14.2 | 12.817 | 5 | 15 38 53.91 | 2.1739 | 18 42 25.7 | 10.318 |
| 6 | 14 3 30.47 | 1.9067 | 9 29 2.5 | 12.792 | 6 | 15 41 4.55 | 2.1808 | 18 52 42.3 | 10.235 |
| 7 | 14 5 25.00 | 1.9110 | 9 41 49.2 | 12.765 | 7 | 15 43 15.61 | 2.1877 | 19 2 53.9 | 10.151 |
| 8 | 14 7 19.79 | 1.9153 | 9 54 34.3 | 12.737 | 8 | 15 45 27.08 | 2.1946 | 19 13 0.4 | 10.064 |
| 9 | 14 9 14.84 | 1.9197 | 10 7 17.6 | 12.707 | 9 | 15 47 38.96 | 2.2015 | 19 23 1.6 | 9.978 |
| 10 | 14 11 10.15 | 1.9240 | 10 19 59.1 | 12.677 | 10 | 15 49 51.26 | 2.2085 | 19 32 57.5 | 9.887 |
| 11 | 14 13 5.72 | 1.9284 | 10 32 38.8 | 12.647 | 11 | 15 52 3.98 | 2.2155 | 19 42 48.1 | 9.797 |
| 12 | 14 15 1.56 | 1.9330 | 10 45 16.7 | 12.615 | 12 | 15 54 17.12 | 2.2225 | 19 52 33.2 | 9.705 |
| 13 | 14 16 57.68 | 1.9377 | 10 57 52.6 | 12.582 | 13 | 15 56 30.68 | 2.2296 | 20 2 12.7 | 9.612 |
| 14 | 14 18 54.09 | 1.9425 | 11 10 26.5 | 12.548 | 14 | 15 58 44.67 | 2.2367 | 20 11 46.6 | 9.517 |
| 15 | 14 20 50.78 | 1.9473 | 11 22 58.3 | 12.513 | 15 | 16 0 59.08 | 2.2437 | 20 21 14.8 | 9.421 |
| 16 | 14 22 47.76 | 1.9522 | 11 35 28.0 | 12.477 | 16 | 16 3 13.92 | 2.2508 | 20 30 37.1 | 9.322 |
| 17 | 14 24 45.04 | 1.9571 | 11 47 55.5 | 12.439 | 17 | 16 5 29.18 | 2.2578 | 20 39 53.5 | 9.223 |
| 18 | 14 26 42.61 | 1.9620 | 12 0 20.7 | 12.401 | 18 | 16 7 44.86 | 2.2649 | 20 49 3.9 | 9.122 |
| 19 | 14 28 40.48 | 1.9671 | 12 12 43.6 | 12.362 | 19 | 16 10 0.97 | 2.2721 | 20 58 8.2 | 9.020 |
| 20 | 14 30 38.66 | 1.9723 | 12 25 4.2 | 12.322 | 20 | 16 12 17.51 | 2.2792 | 21 7 6.3 | 8.917 |
| 21 | 14 32 37.15 | 1.9775 | 12 37 22.3 | 12.281 | 21 | 16 14 34.47 | 2.2864 | 21 15 58.2 | 8.812 |
| 22 | 14 34 35.96 | 1.9827 | 12 49 37.9 | 12.238 | 22 | 16 16 51.86 | 2.2933 | 21 24 43.7 | 8.704 |
| 23 | 14 36 35.08 | 1.9880 | S. 13 1 50.9 | 12.194 | 23 | 16 19 9.67 | 2.3003 | S. 21 33 22.7 | 8.596 |
| THURSDAY 18. | | | | | SATURDAY 20. | | | | |
| 0 | 14 38 34.52 | 1.9934 | S. 13 14 1.2 | 12.149 | 0 | 16 21 27.90 | 2.3074 | S. 21 41 55.2 | 8.487 |
| 1 | 14 40 34.20 | 1.9989 | 13 26 8.8 | 12.104 | 1 | 16 23 46.56 | 2.3145 | 21 50 21.1 | 8.375 |
| 2 | 14 42 34.39 | 2.0043 | 13 38 13.7 | 12.057 | 2 | 16 26 5.64 | 2.3216 | 21 58 40.2 | 8.262 |
| 3 | 14 44 34.81 | 2.0098 | 13 50 15.7 | 12.009 | 3 | 16 28 25.15 | 2.3287 | 22 6 52.5 | 8.148 |
| 4 | 14 46 35.57 | 2.0153 | 14 2 14.8 | 11.960 | 4 | 16 30 45.08 | 2.3356 | 22 14 57.9 | 8.033 |
| 5 | 14 48 36.68 | 2.0213 | 14 14 10.9 | 11.909 | 5 | 16 33 5.42 | 2.3425 | 22 22 56.4 | 7.915 |
| 6 | 14 50 38.13 | 2.0271 | 14 26 3.9 | 11.857 | 6 | 16 35 26.18 | 2.3495 | 22 30 47.7 | 7.795 |
| 7 | 14 52 39.93 | 2.0329 | 14 37 53.8 | 11.805 | 7 | 16 37 47.36 | 2.3564 | 22 38 31.8 | 7.675 |
| 8 | 14 54 42.08 | 2.0387 | 14 49 40.5 | 11.751 | 8 | 16 40 8.95 | 2.3633 | 22 46 8.7 | 7.553 |
| 9 | 14 56 44.58 | 2.0447 | 15 1 23.9 | 11.696 | 9 | 16 42 30.96 | 2.3702 | 22 53 38.2 | 7.430 |
| 10 | 14 58 47.44 | 2.0507 | 15 13 4.0 | 11.639 | 10 | 16 44 53.38 | 2.3771 | 23 1 0.3 | 7.306 |
| 11 | 15 0 50.66 | 2.0567 | 15 24 40.6 | 11.581 | 11 | 16 47 16.21 | 2.3838 | 23 8 14.9 | 7.179 |
| 12 | 15 2 54.25 | 2.0628 | 15 36 13.7 | 11.522 | 12 | 16 49 39.44 | 2.3906 | 23 15 21.8 | 7.051 |
| 13 | 15 4 58.20 | 2.0689 | 15 47 43.2 | 11.462 | 13 | 16 52 3.08 | 2.3973 | 23 22 21.0 | 6.923 |
| 14 | 15 7 2.52 | 2.0752 | 15 59 9.1 | 11.401 | 14 | 16 54 27.12 | 2.4039 | 23 29 12.4 | 6.792 |
| 15 | 15 9 7.22 | 2.0815 | 16 10 31.3 | 11.338 | 15 | 16 56 51.55 | 2.4105 | 23 35 56.0 | 6.660 |
| 16 | 15 11 12.30 | 2.0878 | 16 21 49.7 | 11.271 | 16 | 16 59 16.38 | 2.4171 | 23 42 31.6 | 6.527 |
| 17 | 15 13 17.76 | 2.0942 | 16 33 4.2 | 11.208 | 17 | 17 1 41.60 | 2.4236 | 23 48 59.2 | 6.391 |
| 18 | 15 15 23.60 | 2.1006 | 16 44 14.7 | 11.142 | 18 | 17 4 7.21 | 2.4301 | 23 55 18.6 | 6.254 |
| 19 | 15 17 29.83 | 2.1071 | 16 55 21.2 | 11.074 | 19 | 17 6 33.21 | 2.4364 | 24 1 29.7 | 6.117 |
| 20 | 15 19 36.45 | 2.1135 | 17 6 23.6 | 11.004 | 20 | 17 8 59.58 | 2.4427 | 24 7 32.6 | 5.978 |
| 21 | 15 21 43.45 | 2.1200 | 17 17 21.7 | 10.933 | 21 | 17 11 26.33 | 2.4489 | 24 13 27.1 | 5.837 |
| 22 | 15 23 50.85 | 2.1267 | 17 28 15.5 | 10.861 | 22 | 17 13 53.45 | 2.4551 | 24 19 13.1 | 5.696 |
| 23 | 15 25 58.65 | 2.1333 | 17 39 5.0 | 10.788 | 23 | 17 16 20.94 | 2.4612 | 24 24 50.6 | 5.552 |
| 24 | 15 28 6.85 | 2.1400 | S. 17 49 50.1 | 10.713 | 24 | 17 18 48.79 | 2.4679 | S. 24 30 19.4 | 5.407 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|------------|------------------|---------------------|------------------|---------------------|---------------|------------------|---------------------|------------------|---------------------|
| SUNDAY 21. | | | | | TUESDAY 23. | | | | |
| 0 | 17 18 48.79 | 2.4672 | S. 24° 30' 19.4" | 5.407 | 0 | 19 22 1.68 | 2.6142 | S. 25° 43' 34.9" | 2.613 |
| 1 | 17 21 17.00 | 2.4732 | 24 35 30.5 | 5.262 | 1 | 19 24 38.52 | 2.6137 | 25 40 52.8 | 2.790 |
| 2 | 17 23 45.57 | 2.4790 | 24 40 50.8 | 5.115 | 2 | 19 27 15.32 | 2.6130 | 25 38 0.1 | 2.967 |
| 3 | 17 26 14.48 | 2.4847 | 24 45 53.3 | 4.967 | 3 | 19 29 52.08 | 2.6122 | 25 34 56.8 | 3.143 |
| 4 | 17 28 43.73 | 2.4903 | 24 50 46.8 | 4.817 | 4 | 19 32 28.79 | 2.6119 | 25 31 43.0 | 3.318 |
| 5 | 17 31 13.32 | 2.4959 | 24 55 31.3 | 4.665 | 5 | 19 35 5.43 | 2.6101 | 25 28 18.7 | 3.493 |
| 6 | 17 33 43.24 | 2.5014 | 25 0 6.6 | 4.513 | 6 | 19 37 42.00 | 2.6088 | 25 24 43.8 | 3.668 |
| 7 | 17 36 13.49 | 2.5067 | 25 4 32.8 | 4.360 | 7 | 19 40 18.49 | 2.6074 | 25 20 58.5 | 3.843 |
| 8 | 17 38 44.05 | 2.5119 | 25 8 49.8 | 4.205 | 8 | 19 42 54.89 | 2.6059 | 25 17 2.7 | 4.017 |
| 9 | 17 41 14.92 | 2.5171 | 25 12 57.4 | 4.049 | 9 | 19 45 31.20 | 2.6042 | 25 12 56.5 | 4.190 |
| 10 | 17 43 46.10 | 2.5222 | 25 16 55.7 | 3.893 | 10 | 19 48 7.40 | 2.6023 | 25 8 39.9 | 4.369 |
| 11 | 17 46 17.59 | 2.5272 | 25 20 44.6 | 3.735 | 11 | 19 50 43.48 | 2.6003 | 25 4 13.0 | 4.535 |
| 12 | 17 48 49.37 | 2.5320 | 25 24 23.9 | 3.575 | 12 | 19 53 19.44 | 2.5982 | 24 59 35.7 | 4.707 |
| 13 | 17 51 21.43 | 2.5367 | 25 27 53.6 | 3.415 | 13 | 19 55 55.27 | 2.5960 | 24 54 48.1 | 4.878 |
| 14 | 17 53 53.78 | 2.5414 | 25 31 13.7 | 3.255 | 14 | 19 58 30.96 | 2.5937 | 24 49 50.3 | 5.048 |
| 15 | 17 56 26.40 | 2.5458 | 25 34 24.2 | 3.093 | 15 | 20 1 6.51 | 2.5912 | 24 44 42.3 | 5.218 |
| 16 | 17 58 59.28 | 2.5502 | 25 37 24.9 | 2.929 | 16 | 20 3 41.90 | 2.5885 | 24 39 24.1 | 5.387 |
| 17 | 18 1 32.42 | 2.5544 | 25 40 15.7 | 2.764 | 17 | 20 6 17.13 | 2.5857 | 24 33 55.8 | 5.555 |
| 18 | 18 4 5.81 | 2.5585 | 25 42 56.6 | 2.599 | 18 | 20 8 52.19 | 2.5828 | 24 28 17.5 | 5.722 |
| 19 | 18 6 39.44 | 2.5625 | 25 45 27.6 | 2.434 | 19 | 20 11 27.07 | 2.5798 | 24 22 29.2 | 5.888 |
| 20 | 18 9 13.31 | 2.5663 | 25 47 48.7 | 2.267 | 20 | 20 14 1.77 | 2.5767 | 24 16 30.9 | 6.055 |
| 21 | 18 11 47.40 | 2.5700 | 25 49 59.7 | 2.099 | 21 | 20 16 36.28 | 2.5735 | 24 10 22.6 | 6.221 |
| 22 | 18 14 21.71 | 2.5736 | 25 52 0.6 | 1.931 | 22 | 20 19 10.59 | 2.5701 | 24 4 4.4 | 6.384 |
| 23 | 18 16 56.23 | 2.5771 | S. 25° 53' 51.4" | 1.762 | 23 | 20 21 44.69 | 2.5667 | S. 23° 57' 36.5" | 6.546 |
| MONDAY 22. | | | | | WEDNESDAY 24. | | | | |
| 0 | 18 19 30.96 | 2.5804 | S. 25° 55' 32.0" | 1.592 | 0 | 20 24 18.59 | 2.5632 | S. 23° 50' 58.9" | 6.708 |
| 1 | 18 22 5.88 | 2.5835 | 25 57 2.4 | 1.421 | 1 | 20 26 52.27 | 2.5595 | 23 44 11.6 | 6.869 |
| 2 | 18 24 40.98 | 2.5863 | 25 58 22.5 | 1.250 | 2 | 20 29 25.73 | 2.5557 | 23 37 14.6 | 7.029 |
| 3 | 18 27 16.26 | 2.5894 | 25 59 32.4 | 1.078 | 3 | 20 31 58.95 | 2.5518 | 23 30 8.1 | 7.187 |
| 4 | 18 29 51.71 | 2.5921 | 26 0 31.9 | 0.906 | 4 | 20 34 31.94 | 2.5478 | 23 22 52.1 | 7.345 |
| 5 | 18 32 27.31 | 2.5946 | 26 1 21.1 | 0.733 | 5 | 20 37 4.69 | 2.5437 | 23 15 26.7 | 7.501 |
| 6 | 18 35 3.06 | 2.5970 | 26 1 50.9 | 0.559 | 6 | 20 39 37.19 | 2.5396 | 23 7 52.0 | 7.656 |
| 7 | 18 37 38.95 | 2.5992 | 26 2 28.2 | 0.385 | 7 | 20 42 9.44 | 2.5354 | 23 0 8.0 | 7.810 |
| 8 | 18 40 14.97 | 2.6014 | 26 2 46.1 | 0.211 | 8 | 20 44 41.43 | 2.5311 | 22 52 14.8 | 7.963 |
| 9 | 18 42 51.12 | 2.6034 | 26 2 53.5 | - 0.036 | 9 | 20 47 13.17 | 2.5267 | 22 44 12.4 | 8.115 |
| 10 | 18 45 27.38 | 2.6052 | 26 2 50.4 | + 0.140 | 10 | 20 49 44.64 | 2.5222 | 22 36 1.0 | 8.265 |
| 11 | 18 48 3.74 | 2.6068 | 26 2 36.7 | 0.316 | 11 | 20 52 15.83 | 2.5176 | 22 27 40.6 | 8.414 |
| 12 | 18 50 40.20 | 2.6083 | 26 2 12.5 | 0.492 | 12 | 20 54 46.75 | 2.5130 | 22 19 11.3 | 8.562 |
| 13 | 18 53 16.74 | 2.6097 | 26 1 37.7 | 0.668 | 13 | 20 57 17.39 | 2.5083 | 22 10 33.2 | 8.708 |
| 14 | 18 55 53.36 | 2.6109 | 26 0 52.3 | 0.844 | 14 | 20 59 47.74 | 2.5035 | 22 1 46.3 | 8.853 |
| 15 | 18 58 30.05 | 2.6119 | 25 59 56.4 | 1.021 | 15 | 21 2 17.81 | 2.4987 | 21 52 50.8 | 8.996 |
| 16 | 19 1 6.79 | 2.6127 | 25 58 49.8 | 1.198 | 16 | 21 4 47.59 | 2.4938 | 21 43 46.8 | 9.138 |
| 17 | 19 3 43.58 | 2.6135 | 25 57 32.6 | 1.375 | 17 | 21 7 17.07 | 2.4889 | 21 34 34.2 | 9.280 |
| 18 | 19 6 20.41 | 2.6141 | 25 56 4.8 | 1.552 | 18 | 21 9 46.26 | 2.4840 | 21 25 13.2 | 9.419 |
| 19 | 19 8 57.27 | 2.6145 | 25 54 26.4 | 1.729 | 19 | 21 12 15.15 | 2.4789 | 21 15 43.9 | 9.557 |
| 20 | 19 11 34.15 | 2.6147 | 25 52 37.3 | 1.906 | 20 | 21 14 43.73 | 2.4738 | 21 6 6.4 | 9.693 |
| 21 | 19 14 11.04 | 2.6148 | 25 50 37.6 | 2.083 | 21 | 21 17 12.00 | 2.4687 | 20 56 20.7 | 9.829 |
| 22 | 19 16 47.93 | 2.6147 | 25 48 27.3 | 2.260 | 22 | 21 19 39.97 | 2.4636 | 20 46 26.9 | 9.962 |
| 23 | 19 19 24.81 | 2.6146 | 25 46 6.4 | 2.437 | 23 | 21 22 7.63 | 2.4583 | 20 36 25.2 | 10.094 |
| 24 | 19 22 1.68 | 2.6142 | S. 25° 43' 34.9" | 2.613 | 24 | 21 24 34.97 | 2.4531 | S. 20° 26' 15.6" | 10.225 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|--|---------------------|------------------|---------------------|--------------|--|---------------------|------------------|---------------------|
| THURSDAY 25. | | | | | SATURDAY 27. | | | | |
| 0 | ^h 21 ^m 24 ^s 34.97 | 2.4531 | S. 20° 26' 15.6" | 10.325 | 0 | ^h 23 ^m 16 ^s 17.60 | 2.3121 | S. 10° 15' 29.6" | 14.597 |
| 1 | 21 27 2.00 | 2.4478 | 20 15 58.2 | 10.354 | 1 | 23 18 30.20 | 2.3081 | 10 0 52.2 | 14.648 |
| 2 | 21 29 28.71 | 2.4425 | 20 5 33.1 | 10.482 | 2 | 23 20 42.57 | 2.3042 | 9 46 11.8 | 14.697 |
| 3 | 21 31 55.10 | 2.4372 | 19 55 0.4 | 10.608 | 3 | 23 22 54.71 | 2.3004 | 9 31 28.5 | 14.746 |
| 4 | 21 34 21.17 | 2.4318 | 19 44 20.2 | 10.732 | 4 | 23 25 6.62 | 2.1967 | 9 16 42.3 | 14.793 |
| 5 | 21 36 46.92 | 2.4265 | 19 33 32.6 | 10.854 | 5 | 23 27 18.31 | 2.1929 | 9 1 53.3 | 14.838 |
| 6 | 21 39 12.35 | 2.4212 | 19 22 37.7 | 10.976 | 6 | 23 29 29.77 | 2.1892 | 8 47 1.7 | 14.882 |
| 7 | 21 41 37.46 | 2.4158 | 19 11 35.5 | 11.096 | 7 | 23 31 41.02 | 2.1857 | 8 32 7.5 | 14.924 |
| 8 | 21 44 2.24 | 2.4103 | 19 0 26.2 | 11.213 | 8 | 23 33 52.06 | 2.1822 | 8 17 10.8 | 14.964 |
| 9 | 21 46 26.70 | 2.4049 | 18 49 9.9 | 11.329 | 9 | 23 36 2.88 | 2.1787 | 8 2 11.8 | 15.003 |
| 10 | 21 48 50.83 | 2.3995 | 18 37 46.7 | 11.444 | 10 | 23 38 13.50 | 2.1754 | 7 47 10.5 | 15.041 |
| 11 | 21 51 14.64 | 2.3941 | 18 26 16.6 | 11.558 | 11 | 23 40 23.93 | 2.1722 | 7 32 6.9 | 15.077 |
| 12 | 21 53 38.12 | 2.3887 | 18 14 39.7 | 11.670 | 12 | 23 42 34.17 | 2.1690 | 7 17 1.2 | 15.112 |
| 13 | 21 56 1.28 | 2.3832 | 18 2 56.2 | 11.780 | 13 | 23 44 44.21 | 2.1658 | 7 1 53.5 | 15.144 |
| 14 | 21 58 24.11 | 2.3778 | 17 51 6.1 | 11.888 | 14 | 23 46 54.07 | 2.1628 | 6 46 43.9 | 15.176 |
| 15 | 22 0 46.62 | 2.3724 | 17 39 9.6 | 11.995 | 15 | 23 49 3.75 | 2.1599 | 6 31 32.4 | 15.207 |
| 16 | 22 3 8.80 | 2.3670 | 17 27 6.7 | 12.100 | 16 | 23 51 13.26 | 2.1570 | 6 16 19.1 | 15.235 |
| 17 | 22 5 30.66 | 2.3617 | 17 14 57.6 | 12.203 | 17 | 23 53 22.59 | 2.1541 | 6 1 4.2 | 15.261 |
| 18 | 22 7 52.20 | 2.3563 | 17 2 42.3 | 12.305 | 18 | 23 55 31.75 | 2.1513 | 5 45 47.8 | 15.286 |
| 19 | 22 10 13.42 | 2.3510 | 16 50 21.0 | 12.405 | 19 | 23 57 40.75 | 2.1487 | 5 30 29.9 | 15.311 |
| 20 | 22 12 34.32 | 2.3456 | 16 37 53.7 | 12.504 | 20 | 23 59 49.60 | 2.1462 | 5 15 10.5 | 15.334 |
| 21 | 22 14 54.80 | 2.3403 | 16 25 20.5 | 12.601 | 21 | 0 1 58.29 | 2.1436 | 4 59 49.8 | 15.355 |
| 22 | 22 17 15.15 | 2.3350 | 16 12 41.6 | 12.696 | 22 | 0 4 6.83 | 2.1412 | 4 44 27.9 | 15.374 |
| 23 | 22 19 35.09 | 2.3298 | S. 15° 59' 57.0" | 12.790 | 23 | 0 6 15.23 | 2.1389 | S. 4° 29' 4.9" | 15.393 |
| FRIDAY 26. | | | | | SUNDAY 28. | | | | |
| 0 | 22 21 54.72 | 2.3246 | S. 15° 47' 6.8" | 12.882 | 0 | 0 8 23.50 | 2.1367 | S. 4° 13' 40.8" | 15.410 |
| 1 | 22 24 14.04 | 2.3194 | 15 34 11.2 | 12.972 | 1 | 0 10 31.63 | 2.1344 | 3 58 15.7 | 15.425 |
| 2 | 22 26 33.05 | 2.3142 | 15 21 10.2 | 13.061 | 2 | 0 12 39.63 | 2.1322 | 3 42 49.8 | 15.438 |
| 3 | 22 28 51.74 | 2.3090 | 15 8 3.9 | 13.148 | 3 | 0 14 47.50 | 2.1302 | 3 27 23.1 | 15.451 |
| 4 | 22 31 10.13 | 2.3039 | 14 54 52.5 | 13.233 | 4 | 0 16 55.26 | 2.1283 | 3 11 55.6 | 15.463 |
| 5 | 22 33 28.21 | 2.2988 | 14 41 36.0 | 13.317 | 5 | 0 19 2.90 | 2.1264 | 2 56 27.5 | 15.473 |
| 6 | 22 35 45.99 | 2.2938 | 14 28 14.5 | 13.398 | 6 | 0 21 10.43 | 2.1246 | 2 40 58.9 | 15.481 |
| 7 | 22 38 3.47 | 2.2889 | 14 14 48.2 | 13.478 | 7 | 0 23 17.85 | 2.1229 | 2 25 29.8 | 15.488 |
| 8 | 22 40 20.66 | 2.2840 | 14 1 17.1 | 13.557 | 8 | 0 25 25.18 | 2.1213 | 2 10 0.3 | 15.493 |
| 9 | 22 42 37.55 | 2.2791 | 13 47 41.3 | 13.635 | 9 | 0 27 32.41 | 2.1197 | 1 54 30.6 | 15.497 |
| 10 | 22 44 54.15 | 2.2743 | 13 34 0.9 | 13.711 | 10 | 0 29 39.55 | 2.1183 | 1 39 0.7 | 15.500 |
| 11 | 22 47 10.46 | 2.2694 | 13 20 16.0 | 13.784 | 11 | 0 31 46.61 | 2.1169 | 1 23 30.6 | 15.502 |
| 12 | 22 49 26.48 | 2.2647 | 13 6 26.8 | 13.856 | 12 | 0 33 53.58 | 2.1156 | 1 8 0.5 | 15.502 |
| 13 | 22 51 42.22 | 2.2600 | 12 52 33.3 | 13.927 | 13 | 0 36 0.48 | 2.1144 | 0 52 30.4 | 15.501 |
| 14 | 22 53 57.68 | 2.2553 | 12 38 35.6 | 13.996 | 14 | 0 38 7.31 | 2.1132 | 0 37 0.4 | 15.498 |
| 15 | 22 56 12.86 | 2.2507 | 12 24 33.8 | 14.063 | 15 | 0 40 14.07 | 2.1122 | 0 21 30.7 | 15.493 |
| 16 | 22 58 27.77 | 2.2462 | 12 10 28.0 | 14.129 | 16 | 0 42 20.77 | 2.1112 | S. 0° 6' 1.3" | 15.488 |
| 17 | 23 0 42.41 | 2.2417 | 11 56 18.3 | 14.192 | 17 | 0 44 27.41 | 2.1103 | N. 0° 9' 27.8" | 15.482 |
| 18 | 23 2 56.78 | 2.2372 | 11 42 4.9 | 14.254 | 18 | 0 46 34.00 | 2.1095 | 0 24 56.5 | 15.473 |
| 19 | 23 5 10.88 | 2.2329 | 11 27 47.8 | 14.316 | 19 | 0 48 40.55 | 2.1088 | 0 40 24.6 | 15.463 |
| 20 | 23 7 24.73 | 2.2287 | 11 13 27.0 | 14.376 | 20 | 0 50 47.06 | 2.1081 | 0 55 52.1 | 15.452 |
| 21 | 23 9 38.32 | 2.2244 | 10 59 2.6 | 14.434 | 21 | 0 52 53.52 | 2.1074 | 1 11 18.9 | 15.440 |
| 22 | 23 11 51.66 | 2.2203 | 10 44 34.9 | 14.489 | 22 | 0 54 59.95 | 2.1070 | 1 26 44.9 | 15.427 |
| 23 | 23 14 4.75 | 2.2162 | 10 30 3.9 | 14.544 | 23 | 0 57 6.36 | 2.1066 | 1 42 10.1 | 15.412 |
| 24 | 23 16 17.60 | 2.2121 | S. 10° 15' 29.6" | 14.597 | 24 | 0 59 12.74 | 2.1062 | N. 1° 57' 34.3" | 15.395 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------|------------------|---------------------|--------------|---------------------|-------|------------------|---------------------|--------------|---------------------|
|-------|------------------|---------------------|--------------|---------------------|-------|------------------|---------------------|--------------|---------------------|

MONDAY 29.

| | ^h | ^m | ^s | ^s | N. [°] | ['] | [″] | [″] |
|----|--------------|--------------|--------------|--------------|-----------------|--------------|--------------|--------------|
| 0 | 0 | 59 | 12.74 | 2.1089 | 1 | 57 | 34.3 | 15.395 |
| 1 | 1 | 1 | 19.10 | 2.1059 | 2 | 12 | 57.5 | 15.377 |
| 2 | 1 | 3 | 25.45 | 2.1058 | 2 | 28 | 19.6 | 15.359 |
| 3 | 1 | 5 | 31.80 | 2.1057 | 2 | 43 | 40.6 | 15.339 |
| 4 | 1 | 7 | 38.14 | 2.1057 | 2 | 59 | 0.3 | 15.317 |
| 5 | 1 | 9 | 44.48 | 2.1057 | 3 | 14 | 18.7 | 15.295 |
| 6 | 1 | 11 | 50.83 | 2.1058 | 3 | 29 | 35.7 | 15.271 |
| 7 | 1 | 13 | 57.18 | 2.1060 | 3 | 44 | 51.2 | 15.245 |
| 8 | 1 | 16 | 3.55 | 2.1063 | 4 | 0 | 5.1 | 15.218 |
| 9 | 1 | 18 | 9.94 | 2.1067 | 4 | 15 | 17.4 | 15.191 |
| 10 | 1 | 20 | 16.35 | 2.1071 | 4 | 30 | 28.0 | 15.168 |
| 11 | 1 | 22 | 22.79 | 2.1077 | 4 | 45 | 36.8 | 15.136 |
| 12 | 1 | 24 | 29.27 | 2.1083 | 5 | 0 | 43.6 | 15.098 |
| 13 | 1 | 26 | 35.79 | 2.1090 | 5 | 15 | 48.5 | 15.065 |
| 14 | 1 | 28 | 42.35 | 2.1097 | 5 | 30 | 51.4 | 15.031 |
| 15 | 1 | 30 | 48.95 | 2.1104 | 5 | 45 | 52.2 | 14.995 |
| 16 | 1 | 32 | 55.60 | 2.1112 | 6 | 0 | 50.8 | 14.958 |
| 17 | 1 | 35 | 2.30 | 2.1122 | 6 | 15 | 47.2 | 14.920 |
| 18 | 1 | 37 | 9.06 | 2.1133 | 6 | 30 | 41.2 | 14.880 |
| 19 | 1 | 39 | 15.89 | 2.1144 | 6 | 45 | 32.8 | 14.839 |
| 20 | 1 | 41 | 22.79 | 2.1155 | 7 | 0 | 21.9 | 14.797 |
| 21 | 1 | 43 | 29.75 | 2.1167 | 7 | 15 | 8.4 | 14.753 |
| 22 | 1 | 45 | 36.79 | 2.1181 | 7 | 29 | 52.3 | 14.708 |
| 23 | 1 | 47 | 43.92 | 2.1195 | N. 7 | 44 | 33.5 | 14.663 |

TUESDAY 30.

| | ^h | ^m | ^s | ^s | N. [°] | ['] | [″] | [″] |
|----|--------------|--------------|--------------|--------------|-----------------|--------------|--------------|--------------|
| 0 | 1 | 49 | 51.13 | 2.1209 | 7 | 59 | 11.9 | 14.616 |
| 1 | 1 | 51 | 58.43 | 2.1224 | 8 | 13 | 47.4 | 14.567 |
| 2 | 1 | 54 | 5.82 | 2.1239 | 8 | 28 | 20.0 | 14.517 |
| 3 | 1 | 56 | 13.30 | 2.1256 | 8 | 42 | 49.5 | 14.466 |
| 4 | 1 | 58 | 20.89 | 2.1273 | 8 | 57 | 15.9 | 14.414 |
| 5 | 2 | 0 | 28.58 | 2.1291 | 9 | 11 | 39.2 | 14.361 |
| 6 | 2 | 2 | 36.38 | 2.1309 | 9 | 25 | 59.2 | 14.305 |
| 7 | 2 | 4 | 44.29 | 2.1328 | 9 | 40 | 15.8 | 14.249 |
| 8 | 2 | 6 | 52.32 | 2.1348 | 9 | 54 | 29.1 | 14.192 |
| 9 | 2 | 9 | 0.47 | 2.1368 | 10 | 8 | 38.9 | 14.134 |
| 10 | 2 | 11 | 8.74 | 2.1388 | 10 | 22 | 45.2 | 14.074 |
| 11 | 2 | 13 | 17.13 | 2.1409 | 10 | 36 | 47.8 | 14.012 |
| 12 | 2 | 15 | 25.65 | 2.1432 | 10 | 50 | 46.7 | 13.950 |
| 13 | 2 | 17 | 34.31 | 2.1454 | 11 | 4 | 41.8 | 13.887 |
| 14 | 2 | 19 | 43.10 | 2.1477 | 11 | 18 | 33.1 | 13.823 |
| 15 | 2 | 21 | 52.03 | 2.1501 | 11 | 32 | 20.5 | 13.757 |
| 16 | 2 | 24 | 1.11 | 2.1525 | 11 | 46 | 3.9 | 13.689 |
| 17 | 2 | 26 | 10.33 | 2.1549 | 11 | 59 | 43.2 | 13.620 |
| 18 | 2 | 28 | 19.70 | 2.1574 | 12 | 13 | 18.3 | 13.550 |
| 19 | 2 | 30 | 29.22 | 2.1600 | 12 | 26 | 49.2 | 13.479 |
| 20 | 2 | 32 | 38.90 | 2.1627 | 12 | 40 | 15.8 | 13.407 |
| 21 | 2 | 34 | 48.74 | 2.1653 | 12 | 53 | 38.1 | 13.334 |
| 22 | 2 | 36 | 58.74 | 2.1680 | 13 | 6 | 55.9 | 13.259 |
| 23 | 2 | 39 | 8.90 | 2.1708 | 13 | 20 | 9.2 | 13.183 |
| 24 | 2 | 41 | 19.23 | 2.1736 | N. 13 | 33 | 17.9 | 13.106 |

WEDNESDAY, JULY 1.

| | ^h | ^m | ^s | ^s | N. [°] | ['] | [″] | [″] |
|---|--------------|--------------|--------------|--------------|-----------------|--------------|--------------|--------------|
| 0 | 2 | 41 | 19.23 | 2.1736 | 13 | 33 | 17.9 | 13.106 |

PHASES OF THE MOON.

| | | ^d | ^h | ^m |
|---|---------------------|--------------|--------------|--------------|
| ● | New Moon . . . June | 6 | 4 | 26.2 |
| ☾ | First Quarter . . . | 14 | 0 | 33.9 |
| ○ | Full Moon . . . | 21 | 17 | 12.1 |
| ☾ | Last Quarter . . . | 28 | 11 | 15.9 |

| | | ^d | ^h |
|---|--------------------|--------------|--------------|
| ☾ | Apogee. . . . June | 13 | 12.0 |
| ☾ | Perigee. | 25 | 16.8 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|--------------|----------------|-------------|----------------|-------------|----------------|--------------|----------------|
| 1 | Antares W. | 114° 35' 55" | 9991 | 116° 22' 7" | 9993 | 118° 8' 17" | 9994 | 119° 54' 25" | 9996 |
| | α Aquilæ W. | 69 22 15 | 3198 | 70 48 26 | 3190 | 72 14 59 | 3163 | 73 41 53 | 3148 |
| | Fomalhaut W. | 34 22 19 | 2831 | 35 56 7 | 2786 | 37 30 53 | 2747 | 39 6 30 | 2713 |
| | VENUS E. | 38 26 22 | 2659 | 36 48 47 | 2660 | 35 11 14 | 2661 | 33 33 42 | 2663 |
| | SUN E. | 67 19 9 | 2579 | 65 39 45 | 2580 | 64 0 22 | 2581 | 62 21 1 | 2582 |
| 2 | α Aquilæ W. | 81 0 7 | 3101 | 82 28 16 | 3096 | 83 56 33 | 3094 | 85 24 47 | 3093 |
| | Fomalhaut W. | 47 13 59 | 2609 | 48 52 51 | 2588 | 50 32 2 | 2576 | 52 11 30 | 2566 |
| | α Pegasi W. | 34 22 12 | 3891 | 35 35 41 | 3756 | 36 51 29 | 3641 | 38 9 19 | 3541 |
| | SUN E. | 54 4 43 | 2591 | 52 25 36 | 2593 | 50 46 32 | 2596 | 49 7 32 | 2600 |
| 3 | α Aquilæ W. | 92 45 54 | 3110 | 94 13 51 | 3119 | 95 41 38 | 3129 | 97 9 13 | 3139 |
| | Fomalhaut W. | 60 31 41 | 2535 | 62 12 5 | 2533 | 63 52 32 | 2531 | 65 33 2 | 2531 |
| | α Pegasi W. | 45 2 10 | 3197 | 46 28 23 | 3152 | 47 55 30 | 3111 | 49 23 26 | 3076 |
| | SUN E. | 40 53 46 | 2620 | 39 15 18 | 2625 | 37 36 57 | 2630 | 35 58 43 | 2635 |
| 4 | α Aquilæ W. | 104 23 5 | 3222 | 105 48 48 | 3243 | 107 14 6 | 3268 | 108 38 55 | 3294 |
| | Fomalhaut W. | 73 55 18 | 2540 | 75 35 35 | 2544 | 77 15 47 | 2549 | 78 55 52 | 2554 |
| | α Pegasi W. | 56 52 21 | 2955 | 58 23 30 | 2940 | 59 54 58 | 2927 | 61 26 42 | 2917 |
| | SUN E. | 27 49 35 | 2669 | 26 12 13 | 2677 | 24 35 2 | 2684 | 22 58 1 | 2693 |
| 7 | SUN W. | 10 13 39 | 2939 | 11 45 9 | 2950 | 13 16 25 | 2961 | 14 47 27 | 2972 |
| | Regulus E. | 61 51 7 | 2617 | 60 12 35 | 2631 | 58 34 22 | 2644 | 56 56 27 | 2657 |
| | Spica E. | 115 54 19 | 2624 | 114 15 56 | 2635 | 112 37 49 | 2647 | 110 59 58 | 2660 |
| 8 | SUN W. | 22 18 46 | 3038 | 23 48 12 | 3051 | 25 17 22 | 3065 | 26 46 14 | 3079 |
| | Regulus E. | 48 51 27 | 2797 | 47 15 23 | 2742 | 45 39 39 | 2756 | 44 4 14 | 2772 |
| | Spica E. | 102 54 54 | 2722 | 101 18 44 | 2735 | 99 42 51 | 2748 | 98 7 15 | 2760 |
| 9 | SUN W. | 34 6 24 | 3147 | 35 33 37 | 3160 | 37 0 34 | 3174 | 38 27 14 | 3187 |
| | Regulus E. | 36 12 7 | 2948 | 34 38 41 | 2964 | 33 5 36 | 2980 | 31 32 52 | 2998 |
| | Spica E. | 90 13 25 | 2994 | 88 39 28 | 2937 | 87 5 48 | 2949 | 85 32 24 | 2962 |
| 10 | SUN W. | 45 36 47 | 3249 | 47 1 58 | 3261 | 48 26 55 | 3273 | 49 51 38 | 3284 |
| | Pollux W. | 13 7 20 | 2985 | 14 37 51 | 2985 | 16 8 22 | 2995 | 17 38 53 | 2998 |
| | Spica E. | 77 49 17 | 2920 | 76 17 24 | 2939 | 74 45 46 | 2942 | 73 14 21 | 2954 |
| | Antares E. | 123 43 28 | 2916 | 122 11 29 | 2926 | 120 39 43 | 2936 | 119 8 10 | 2946 |
| 11 | SUN W. | 56 52 4 | 3336 | 58 15 34 | 3345 | 59 38 54 | 3354 | 61 2 3 | 3363 |
| | Pollux W. | 25 10 30 | 3008 | 26 40 33 | 3013 | 28 10 30 | 3018 | 29 40 20 | 3023 |
| | Spica E. | 65 40 36 | 3004 | 64 10 28 | 3013 | 62 40 31 | 3022 | 61 10 45 | 3030 |
| | Antares E. | 111 33 28 | 2992 | 110 3 5 | 3001 | 108 32 53 | 3008 | 107 2 50 | 3016 |
| 12 | SUN W. | 67 55 34 | 3398 | 69 17 53 | 3404 | 70 40 5 | 3409 | 72 2 11 | 3415 |
| | Pollux W. | 37 7 50 | 3050 | 38 37 1 | 3055 | 40 6 6 | 3059 | 41 35 6 | 3062 |
| | Spica E. | 53 44 28 | 3069 | 52 15 40 | 3075 | 50 47 0 | 3082 | 49 18 28 | 3088 |
| | Antares E. | 99 34 49 | 3048 | 98 5 36 | 3053 | 96 36 29 | 3058 | 95 7 28 | 3062 |
| 13 | SUN W. | 78 51 30 | 3431 | 80 13 12 | 3433 | 81 34 51 | 3434 | 82 56 29 | 3435 |
| | Pollux W. | 48 59 8 | 3075 | 50 27 48 | 3076 | 51 56 27 | 3078 | 53 25 4 | 3078 |
| | Spica E. | 41 57 33 | 3114 | 40 29 41 | 3119 | 39 1 54 | 3124 | 37 34 13 | 3129 |
| | Antares E. | 87 43 33 | 3078 | 86 14 56 | 3080 | 84 46 22 | 3081 | 83 17 49 | 3082 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|----|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|
| 1 | Antares | W. | 121° 40' 30" | 2298 | 123° 26' 33" | 2300 | 125° 12' 32" | 2302 | 126° 58' 28" | 2305 |
| | α Aquilæ | W. | 75 9 5 | 3135 | 76 36 32 | 3124 | 78 4 13 | 3114 | 79 32 5 | 3106 |
| | Fomalhaut | W. | 40 42 52 | 2685 | 42 19 52 | 2680 | 43 57 26 | 2638 | 45 35 30 | 2619 |
| | Venus | E. | 31 56 12 | 2663 | 30 18 43 | 2666 | 28 41 17 | 2667 | 27 3 53 | 2669 |
| | Sun | E. | 60 41 41 | 2583 | 59 2 23 | 2585 | 57 23 7 | 2587 | 55 43 54 | 2588 |
| 2 | α Aquilæ | W. | 86 53 5 | 3093 | 88 21 23 | 3096 | 89 49 38 | 3099 | 91 17 49 | 3104 |
| | Fomalhaut | W. | 53 51 12 | 2557 | 55 31 6 | 2550 | 57 11 10 | 2544 | 58 51 22 | 2537 |
| | α Pegasi | W. | 39 28 58 | 3454 | 40 50 14 | 3376 | 42 12 58 | 3309 | 43 36 59 | 3249 |
| | Sun | E. | 47 28 37 | 2603 | 45 49 46 | 2607 | 41 11 0 | 2611 | 42 32 20 | 2615 |
| 3 | α Aquilæ | W. | 98 36 35 | 3153 | 100 3 41 | 3168 | 101 30 29 | 3183 | 102 56 58 | 3202 |
| | Fomalhaut | W. | 67 13 32 | 2531 | 68 54 2 | 2533 | 70 34 30 | 2534 | 72 14 56 | 2537 |
| | α Pegasi | W. | 50 52 5 | 3045 | 52 21 22 | 3018 | 53 51 13 | 2993 | 55 21 34 | 2973 |
| | Sun | E. | 34 20 36 | 2641 | 32 42 37 | 2648 | 31 4 47 | 2655 | 29 27 6 | 2662 |
| 4 | α Aquilæ | W. | 110 3 14 | 3222 | 111 27 0 | 3253 | 112 50 10 | 3286 | 114 12 42 | 3322 |
| | Fomalhaut | W. | 80 35 50 | 2580 | 82 15 40 | 2567 | 83 55 20 | 2574 | 85 34 50 | 2582 |
| | α Pegasi | W. | 62 58 39 | 2909 | 64 30 47 | 2901 | 66 3 4 | 2897 | 67 35 27 | 2892 |
| | Sun | E. | 21 21 12 | 2709 | 19 44 35 | 2711 | 18 8 10 | 2721 | 16 31 58 | 2733 |
| 7 | Sun | W. | 16 18 15 | 2985 | 17 48 47 | 2997 | 19 19 3 | 3010 | 20 49 3 | 3024 |
| | Regulus | E. | 55 18 50 | 2671 | 53 41 31 | 2685 | 52 4 31 | 2699 | 50 27 50 | 2713 |
| | Spica | E. | 109 22 24 | 2672 | 107 45 6 | 2684 | 106 8 5 | 2697 | 104 31 21 | 2710 |
| 8 | Sun | W. | 28 14 49 | 3093 | 29 43 7 | 3106 | 31 11 9 | 3119 | 32 38 55 | 3133 |
| | Regulus | E. | 42 29 9 | 2787 | 40 54 24 | 2801 | 39 19 58 | 2818 | 37 45 53 | 2832 |
| | Spica | E. | 96 31 55 | 2774 | 94 56 53 | 2786 | 93 22 7 | 2799 | 91 47 38 | 2811 |
| 9 | Sun | W. | 39 53 39 | 3200 | 41 19 48 | 3213 | 42 45 42 | 3225 | 44 11 22 | 3237 |
| | Regulus | E. | 30 0 31 | 2916 | 28 28 33 | 2935 | 26 56 59 | 2954 | 25 25 49 | 2974 |
| | Spica | E. | 83 59 16 | 2873 | 82 26 23 | 2886 | 80 53 46 | 2898 | 79 21 24 | 2909 |
| 10 | Sun | W. | 51 16 8 | 3295 | 52 40 25 | 3306 | 54 4 30 | 3316 | 55 28 23 | 3326 |
| | Pollux | W. | 19 9 21 | 2990 | 20 39 46 | 2994 | 22 10 6 | 2998 | 23 40 21 | 3003 |
| | Spica | E. | 71 43 10 | 2964 | 70 12 12 | 2975 | 68 41 28 | 2985 | 67 10 56 | 2994 |
| | Antares | E. | 117 36 50 | 2956 | 116 5 42 | 2965 | 114 34 46 | 2974 | 113 4 1 | 2984 |
| 11 | Sun | W. | 62 25 3 | 3371 | 63 47 53 | 3378 | 65 10 35 | 3386 | 66 33 8 | 3392 |
| | Pollux | W. | 31 10 4 | 3030 | 32 39 40 | 3034 | 34 9 10 | 3040 | 35 38 33 | 3045 |
| | Spica | E. | 59 41 10 | 3039 | 58 11 45 | 3047 | 56 42 30 | 3054 | 55 13 24 | 3062 |
| | Antares | E. | 105 32 57 | 3023 | 104 3 13 | 3030 | 102 33 37 | 3036 | 101 4 9 | 3043 |
| 12 | Sun | W. | 73 24 11 | 3418 | 74 46 7 | 3421 | 76 7 58 | 3426 | 77 29 45 | 3428 |
| | Pollux | W. | 43 4 2 | 3066 | 44 32 53 | 3069 | 46 1 41 | 3071 | 47 30 26 | 3073 |
| | Spica | E. | 47 50 4 | 3094 | 46 21 47 | 3099 | 44 53 36 | 3104 | 43 25 31 | 3110 |
| | Antares | E. | 93 38 32 | 3066 | 92 9 41 | 3070 | 90 40 55 | 3073 | 89 12 12 | 3076 |
| 13 | Sun | W. | 84 18 6 | 3438 | 85 39 42 | 3435 | 87 1 19 | 3434 | 88 22 57 | 3433 |
| | Pollux | W. | 54 53 41 | 3078 | 56 22 18 | 3077 | 57 50 56 | 3076 | 59 19 35 | 3075 |
| | Spica | E. | 36 6 33 | 3133 | 34 39 8 | 3138 | 33 11 44 | 3142 | 31 44 25 | 3148 |
| | Antares | E. | 81 49 17 | 3082 | 80 20 46 | 3082 | 78 52 14 | 3082 | 77 23 42 | 3080 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|----|-------------|----------------|------------|----------------|------------|----------------|-------------|----------------|
| 14 | SUN | W. | 89° 44' 36" | 3431 | 91° 6' 17" | 3429 | 92° 28' 1" | 3426 | 93° 49' 48" | 3423 |
| | Pollux | W. | 60 48 15 | 3073 | 62 16 58 | 3070 | 63 45 44 | 3068 | 65 14 33 | 3065 |
| | Regulus | W. | 24 54 49 | 3147 | 26 22 2 | 3137 | 27 49 27 | 3128 | 29 17 3 | 3119 |
| | Spica | E. | 30 17 13 | 3153 | 28 50 8 | 3159 | 27 23 10 | 3167 | 25 56 21 | 3176 |
| | Antares | E. | 75 55 8 | 3078 | 74 26 32 | 3077 | 72 57 54 | 3074 | 71 29 13 | 3072 |
| 15 | SUN | W. | 100 39 53 | 3398 | 102 2 12 | 3392 | 103 24 38 | 3385 | 104 47 12 | 3377 |
| | Pollux | W. | 72 39 51 | 3041 | 74 9 13 | 3034 | 75 38 43 | 3028 | 77 8 21 | 3022 |
| | Regulus | W. | 36 37 43 | 3076 | 38 6 22 | 3067 | 39 35 12 | 3059 | 41 4 12 | 3049 |
| | Antares | E. | 64 4 44 | 3050 | 62 35 33 | 3044 | 61 6 15 | 3039 | 59 36 50 | 3032 |
| | α Aquilæ | E. | 109 34 29 | 3942 | 108 21 52 | 3921 | 107 8 54 | 3901 | 105 55 35 | 3881 |
| 16 | SUN | W. | 111 42 20 | 3333 | 113 5 53 | 3324 | 114 29 37 | 3313 | 115 53 34 | 3302 |
| | Pollux | W. | 84 38 49 | 2980 | 86 9 27 | 2971 | 87 40 16 | 2961 | 89 11 18 | 2951 |
| | Regulus | W. | 48 32 7 | 3001 | 50 2 19 | 2990 | 51 32 44 | 2980 | 53 3 22 | 2969 |
| | Antares | E. | 52 7 36 | 2994 | 50 37 16 | 2986 | 49 6 46 | 2977 | 47 36 5 | 2966 |
| | α Aquilæ | E. | 99 44 9 | 3792 | 98 28 58 | 3776 | 97 13 31 | 3761 | 95 57 48 | 3746 |
| 17 | SUN | W. | 122 56 36 | 3242 | 124 21 55 | 3229 | 125 47 30 | 3216 | 127 13 20 | 3203 |
| | Pollux | W. | 96 49 46 | 2885 | 98 22 11 | 2883 | 99 54 51 | 2871 | 101 27 47 | 2858 |
| | Regulus | W. | 60 40 9 | 2909 | 62 12 16 | 2896 | 63 44 40 | 2883 | 65 17 20 | 2871 |
| | Antares | E. | 39 59 43 | 2920 | 38 27 50 | 2910 | 36 55 44 | 2900 | 35 23 25 | 2890 |
| | α Aquilæ | E. | 89 35 33 | 3682 | 88 18 27 | 3671 | 87 1 9 | 3661 | 85 43 40 | 3651 |
| | Fomalhaut | E. | 122 7 58 | 3125 | 120 40 19 | 3105 | 119 12 16 | 3087 | 117 43 50 | 3068 |
| 18 | Pollux | W. | 109 16 38 | 2792 | 110 51 16 | 2778 | 112 26 13 | 2764 | 114 1 28 | 2750 |
| | Regulus | W. | 73 4 57 | 2802 | 74 39 22 | 2788 | 76 14 6 | 2773 | 77 49 9 | 2760 |
| | Spica | W. | 19 31 27 | 2966 | 21 2 22 | 2928 | 22 34 5 | 2894 | 24 6 31 | 2865 |
| | α Aquilæ | E. | 79 14 1 | 3617 | 77 55 45 | 3612 | 76 37 24 | 3610 | 75 19 1 | 3609 |
| | Fomalhaut | E. | 110 15 58 | 2977 | 108 45 16 | 2960 | 107 14 13 | 2942 | 105 42 48 | 2923 |
| 19 | Regulus | W. | 85 49 8 | 2687 | 87 26 6 | 2672 | 89 3 24 | 2657 | 90 41 2 | 2642 |
| | Spica | W. | 31 57 26 | 2744 | 33 33 8 | 2722 | 35 9 18 | 2703 | 36 45 54 | 2684 |
| | α Aquilæ | E. | 68 47 7 | 3623 | 67 28 57 | 3620 | 66 10 55 | 3640 | 64 53 4 | 3653 |
| | Fomalhaut | E. | 98 0 22 | 2843 | 96 26 50 | 2828 | 94 52 58 | 2812 | 93 18 46 | 2797 |
| | α Pegasi | E. | 115 44 37 | 3178 | 114 18 2 | 3151 | 112 50 54 | 3124 | 111 23 14 | 3099 |
| 20 | Regulus | W. | 98 51 8 | 2571 | 100 33 43 | 2556 | 102 13 38 | 2543 | 103 53 52 | 2529 |
| | Spica | W. | 44 55 3 | 2596 | 46 34 3 | 2580 | 48 13 26 | 2564 | 49 53 11 | 2548 |
| | α Aquilæ | E. | 58 28 14 | 3761 | 57 12 31 | 3793 | 55 57 22 | 3830 | 54 42 51 | 3873 |
| | Fomalhaut | E. | 85 22 55 | 2736 | 83 46 50 | 2713 | 82 10 27 | 2701 | 80 33 48 | 2688 |
| | α Pegasi | E. | 103 57 33 | 2987 | 102 27 4 | 2967 | 100 56 10 | 2948 | 99 24 52 | 2931 |
| 21 | Regulus | W. | 112 19 40 | 2465 | 114 1 43 | 2452 | 115 44 4 | 2441 | 117 26 41 | 2429 |
| | Spica | W. | 58 17 12 | 2475 | 59 59 0 | 2462 | 61 41 7 | 2448 | 63 23 33 | 2436 |
| | Fomalhaut | E. | 72 26 41 | 2636 | 70 48 35 | 2627 | 69 10 17 | 2619 | 67 31 48 | 2612 |
| | α Pegasi | E. | 91 43 4 | 2654 | 90 9 46 | 2641 | 88 36 11 | 2629 | 87 2 21 | 2619 |
| 22 | Spica | W. | 72 0 4 | 2378 | 73 44 11 | 2367 | 75 28 33 | 2357 | 77 13 10 | 2348 |
| | Antares | W. | 26 10 5 | 2414 | 27 53 20 | 2397 | 29 36 59 | 2382 | 31 20 59 | 2368 |
| | Fomalhaut | E. | 59 17 27 | 2592 | 57 38 21 | 2591 | 55 59 14 | 2592 | 54 20 8 | 2594 |
| | α Pegasi | E. | 79 10 9 | 2780 | 77 35 15 | 2776 | 76 0 16 | 2772 | 74 25 12 | 2771 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
| 14 | Sun W. | 95 11 39 | 3418 | 96 33 35 | 3415 | 97 55 35 | 3409 | 99 17 41 | 3404 |
| | Pollux W. | 66 43 26 | 3080 | 68 12 24 | 3056 | 69 41 27 | 3052 | 71 10 36 | 3047 |
| | Regulus W. | 30 44 50 | 3110 | 32 12 48 | 3101 | 33 40 56 | 3083 | 35 9 14 | 3084 |
| | Spica E. | 24 29 43 | 3186 | 26 3 17 | 3199 | 21 37 7 | 3215 | 20 11 16 | 3236 |
| | Antares E. | 70 0 29 | 3068 | 68 31 40 | 3065 | 67 2 47 | 3060 | 65 33 48 | 3056 |
| 15 | Sun W. | 106 9 55 | 3369 | 107 32 47 | 3361 | 108 55 48 | 3352 | 110 18 59 | 3344 |
| | Pollux W. | 78 38 7 | 3014 | 80 8 3 | 3006 | 81 38 8 | 2998 | 83 8 23 | 2989 |
| | Regulus W. | 42 33 24 | 3040 | 44 2 47 | 3031 | 45 32 21 | 3021 | 47 2 8 | 3011 |
| | Antares E. | 58 7 17 | 3025 | 56 37 35 | 3018 | 55 7 45 | 3010 | 53 37 45 | 3003 |
| | α Aquilæ E. | 104 41 56 | 3861 | 103 27 57 | 3843 | 102 13 39 | 3825 | 100 59 3 | 3808 |
| 16 | Sun W. | 117 17 43 | 3290 | 118 42 6 | 3270 | 120 6 42 | 3267 | 121 31 32 | 3255 |
| | Pollux W. | 90 42 32 | 2940 | 92 14 0 | 2930 | 93 45 41 | 2919 | 95 17 36 | 2907 |
| | Regulus W. | 54 34 14 | 2958 | 56 5 20 | 2946 | 57 36 41 | 2934 | 59 8 17 | 2921 |
| | Antares E. | 46 5 12 | 2959 | 44 34 8 | 2950 | 43 2 52 | 2940 | 41 31 24 | 2930 |
| | α Aquilæ E. | 94 41 49 | 3732 | 93 25 36 | 3718 | 92 9 8 | 3706 | 90 52 27 | 3693 |
| 17 | Sun W. | 128 39 26 | 3188 | 130 5 49 | 3175 | 131 32 28 | 3161 | 132 59 24 | 3146 |
| | Pollux W. | 103 1 0 | 2845 | 104 34 29 | 2833 | 106 8 14 | 2819 | 107 42 17 | 2805 |
| | Regulus W. | 60 50 16 | 2857 | 68 23 30 | 2844 | 69 57 1 | 2830 | 71 30 50 | 2816 |
| | Antares E. | 33 50 53 | 2880 | 32 18 8 | 2871 | 30 45 12 | 2862 | 29 12 5 | 2854 |
| | α Aquilæ E. | 84 26 1 | 3643 | 83 8 13 | 3635 | 81 50 16 | 3628 | 80 32 12 | 3622 |
| | Fomalhaut E. | 116 15 1 | 3049 | 114 45 49 | 3030 | 113 16 14 | 3013 | 111 46 17 | 2995 |
| 18 | Pollux W. | 115 37 1 | 2736 | 117 12 53 | 2722 | 118 49 4 | 2707 | 120 25 34 | 2694 |
| | Regulus W. | 79 24 30 | 2745 | 81 0 10 | 2730 | 82 36 10 | 2716 | 84 12 29 | 2701 |
| | Spica W. | 25 39 35 | 2837 | 27 13 15 | 2811 | 28 47 28 | 2788 | 30 22 12 | 2765 |
| | α Aquilæ E. | 74 0 36 | 3609 | 72 42 11 | 3609 | 71 23 46 | 3611 | 70 5 24 | 3616 |
| | Fomalhaut E. | 104 11 1 | 2909 | 102 38 53 | 2891 | 101 6 23 | 2876 | 99 33 33 | 2859 |
| 19 | Regulus W. | 92 19 0 | 2627 | 93 57 18 | 2613 | 95 35 55 | 2599 | 97 14 52 | 2585 |
| | Spica W. | 38 22 55 | 2666 | 40 0 21 | 2647 | 41 38 12 | 2630 | 43 16 26 | 2613 |
| | α Aquilæ E. | 63 35 27 | 3668 | 62 18 6 | 3687 | 61 1 5 | 3709 | 59 44 27 | 3732 |
| | Fomalhaut E. | 91 44 14 | 2782 | 90 9 23 | 2767 | 88 34 12 | 2753 | 86 58 43 | 2739 |
| | α Pegasi E. | 109 55 3 | 3074 | 108 26 22 | 3052 | 106 57 13 | 3029 | 105 27 36 | 3008 |
| 20 | Regulus W. | 105 34 25 | 2516 | 107 15 16 | 2502 | 108 56 26 | 2489 | 110 37 54 | 2477 |
| | Spica W. | 51 33 18 | 2533 | 53 13 46 | 2518 | 54 54 31 | 2503 | 56 35 43 | 2489 |
| | α Aquilæ E. | 53 29 4 | 3920 | 52 16 5 | 3974 | 51 4 0 | 4036 | 49 52 56 | 4104 |
| | Fomalhaut E. | 78 56 52 | 2677 | 77 19 41 | 2666 | 75 42 15 | 2655 | 74 4 35 | 2645 |
| | α Pegasi E. | 97 53 12 | 2913 | 96 21 10 | 2897 | 94 48 47 | 2882 | 93 16 5 | 2867 |
| 21 | Regulus W. | 119 9 34 | 2418 | 120 52 43 | 2408 | 122 36 7 | 2397 | 124 19 46 | 2387 |
| | Spica W. | 65 6 17 | 2424 | 66 49 18 | 2411 | 68 32 37 | 2400 | 70 16 12 | 2388 |
| | Fomalhaut E. | 65 53 10 | 2607 | 64 14 24 | 2601 | 62 35 30 | 2597 | 60 56 31 | 2593 |
| | α Pegasi E. | 85 28 18 | 2809 | 83 54 2 | 2800 | 82 19 34 | 2792 | 80 44 56 | 2785 |
| 22 | Spica W. | 78 58 0 | 2338 | 80 43 4 | 2330 | 82 28 20 | 2321 | 84 13 49 | 2313 |
| | Antares W. | 33 5 19 | 2356 | 34 49 57 | 2344 | 36 34 53 | 2333 | 38 20 4 | 2322 |
| | Fomalhaut E. | 52 41 5 | 2599 | 51 2 8 | 2604 | 49 23 18 | 2612 | 47 44 39 | 2622 |
| | α Pegasi E. | 72 50 6 | 2770 | 71 14 59 | 2772 | 69 39 54 | 2774 | 68 4 52 | 2779 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|--------------|----------------|-------------|----------------|--------------|----------------|--------------|----------------|
| 22 | α Arietis E. | 121° 41' 42" | 9497 | 120° 0' 24" | 9469 | 118° 18' 45" | 9467 | 116° 36' 46" | 9454 |
| 23 | Spica W. | 85 59 29 | 9306 | 87 45 20 | 9299 | 89 31 21 | 9292 | 91 17 32 | 9288 |
| | Antares W. | 40 5 31 | 9313 | 41 51 12 | 9304 | 43 37 5 | 9296 | 45 23 10 | 9289 |
| | Fomalhaut E. | 46 6 14 | 9635 | 44 28 7 | 9651 | 42 50 21 | 9670 | 41 13 1 | 9694 |
| | α Pegasi E. | 66 29 56 | 9785 | 64 55 8 | 9799 | 63 20 29 | 9801 | 61 46 3 | 9813 |
| | α Arietis E. | 108 2 31 | 9399 | 106 18 55 | 9390 | 104 35 6 | 9382 | 102 51 5 | 9373 |
| 24 | Spica W. | 100 10 28 | 9262 | 101 57 23 | 9260 | 103 44 22 | 9256 | 105 31 26 | 9253 |
| | Antares W. | 54 16 6 | 9259 | 56 3 6 | 9254 | 57 50 13 | 9251 | 59 37 25 | 9247 |
| | α Pegasi E. | 53 58 48 | 9919 | 52 26 45 | 9942 | 50 55 19 | 9975 | 49 24 35 | 3014 |
| | α Arietis E. | 94 8 29 | 9344 | 92 23 34 | 9341 | 90 38 34 | 9337 | 88 53 29 | 9335 |
| | Aldebaran E. | 124 44 54 | 9279 | 122 58 14 | 9268 | 121 11 27 | 9263 | 119 24 33 | 9260 |
| 25 | Spica W. | 114 27 30 | 9247 | 116 14 47 | 9248 | 118 2 3 | 9248 | 119 49 19 | 9249 |
| | Antares W. | 68 34 33 | 9236 | 70 22 7 | 9235 | 72 9 42 | 9235 | 73 57 18 | 9234 |
| | α Arietis E. | 80 7 21 | 9230 | 78 22 5 | 9231 | 76 36 50 | 9232 | 74 51 32 | 9233 |
| | Aldebaran E. | 110 28 54 | 9247 | 108 41 36 | 9246 | 106 54 17 | 9245 | 105 6 56 | 9245 |
| | Sun E. | 136 16 30 | 9297 | 134 35 54 | 9295 | 132 55 16 | 9295 | 131 14 38 | 9295 |
| 26 | Antares W. | 82 55 13 | 9239 | 84 42 43 | 9241 | 86 30 10 | 9241 | 88 17 34 | 9245 |
| | α Aquilæ W. | 45 44 59 | 4198 | 46 54 34 | 4019 | 48 5 55 | 3990 | 49 18 54 | 2892 |
| | α Arietis E. | 66 6 29 | 9252 | 64 21 45 | 9258 | 62 37 10 | 9264 | 60 52 44 | 9272 |
| | Aldebaran E. | 96 10 17 | 9249 | 94 23 2 | 9250 | 92 35 49 | 9253 | 90 48 40 | 9255 |
| | Sun E. | 122 51 31 | 9530 | 121 10 59 | 9531 | 119 30 29 | 9533 | 117 50 2 | 9536 |
| 27 | Antares W. | 97 13 35 | 9261 | 99 0 32 | 9264 | 100 47 24 | 9269 | 102 34 9 | 9273 |
| | α Aquilæ W. | 55 43 55 | 3507 | 57 4 11 | 3469 | 58 25 18 | 3419 | 59 47 13 | 3382 |
| | α Arietis E. | 52 13 35 | 9490 | 50 30 29 | 9493 | 48 47 42 | 9448 | 47 5 15 | 9463 |
| | Aldebaran E. | 81 53 55 | 9271 | 80 7 13 | 9275 | 78 20 37 | 9279 | 76 34 7 | 9284 |
| | Sun E. | 109 28 48 | 9552 | 107 48 47 | 9556 | 106 8 52 | 9561 | 104 29 3 | 9566 |
| 28 | Antares W. | 111 26 13 | 9298 | 113 12 15 | 9303 | 114 58 10 | 9309 | 116 43 56 | 9315 |
| | α Aquilæ W. | 66 46 11 | 3946 | 68 11 26 | 3926 | 69 37 4 | 3910 | 71 3 1 | 3197 |
| | Fomalhaut W. | 31 39 42 | 9949 | 33 11 8 | 9989 | 34 43 41 | 9943 | 36 17 13 | 9904 |
| | Aldebaran E. | 67 43 25 | 9310 | 65 57 40 | 9316 | 64 12 4 | 9292 | 62 26 36 | 9298 |
| | Venus E. | 74 7 36 | 9674 | 72 30 21 | 9680 | 70 53 14 | 9685 | 69 16 14 | 9691 |
| | Sun E. | 96 11 37 | 9591 | 94 32 29 | 9596 | 92 53 28 | 9601 | 91 14 35 | 9607 |
| 29 | α Aquilæ W. | 78 16 7 | 3155 | 79 43 10 | 3152 | 81 10 17 | 3150 | 82 37 26 | 3150 |
| | Fomalhaut W. | 44 15 24 | 9681 | 45 52 29 | 9666 | 47 29 54 | 9655 | 49 7 35 | 9645 |
| | α Pegasi W. | 32 10 33 | 4927 | 33 18 34 | 4059 | 34 29 16 | 3914 | 35 42 22 | 3790 |
| | Aldebaran E. | 53 41 39 | 9363 | 51 57 11 | 9370 | 50 12 53 | 9378 | 48 28 47 | 9386 |
| | Venus E. | 61 13 18 | 9723 | 59 37 9 | 9729 | 58 1 8 | 9736 | 56 25 16 | 9744 |
| | Sun E. | 83 2 11 | 9638 | 81 24 8 | 9645 | 79 46 14 | 9651 | 78 8 28 | 9658 |
| 30 | α Aquilæ W. | 89 52 43 | 3168 | 91 19 30 | 3177 | 92 46 7 | 3185 | 94 12 34 | 3196 |
| | Fomalhaut W. | 57 18 39 | 9617 | 58 57 11 | 9615 | 60 35 46 | 9614 | 62 14 22 | 9614 |
| | α Pegasi W. | 42 15 26 | 3372 | 43 38 15 | 3316 | 45 2 8 | 3268 | 46 26 57 | 3225 |
| | Aldebaran E. | 39 51 23 | 9433 | 38 8 36 | 9444 | 36 26 4 | 9456 | 34 43 49 | 9470 |
| | Venus E. | 48 28 18 | 9779 | 46 53 23 | 9787 | 45 18 38 | 9794 | 43 44 2 | 9802 |
| | Sun E. | 70 1 59 | 9693 | 68 25 10 | 9700 | 66 48 30 | 9707 | 65 12 0 | 9715 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|--------------|----------------|--------------|----------------|-------------|----------------|--------------|----------------|
| 22 | α Arietis E. | 114° 54' 28" | 9442 | 113° 11' 53" | 9430 | 111° 29' 1" | 9419 | 109° 45' 53" | 9409 |
| 23 | Spica W. | 93 3 52 | 9281 | 94 50 20 | 9275 | 96 36 56 | 9270 | 98 23 39 | 9266 |
| | Antares W. | 47 9 26 | 9289 | 48 55 52 | 9275 | 50 42 28 | 9269 | 52 29 13 | 9264 |
| | Fomalhaut E. | 39 36 13 | 9722 | 38 0 2 | 9755 | 36 24 35 | 9795 | 34 50 0 | 9840 |
| | α Pegasi E. | 60 11 52 | 9698 | 58 38 0 | 9645 | 57 4 30 | 9664 | 55 31 25 | 9696 |
| | α Arietis E. | 101 6 52 | 9266 | 99 22 29 | 9260 | 97 37 57 | 9255 | 95 53 17 | 9249 |
| 24 | Spica W. | 107 18 34 | 9251 | 109 5 45 | 9250 | 110 52 58 | 9249 | 112 40 13 | 9247 |
| | Antares W. | 61 24 43 | 9243 | 63 12 6 | 9241 | 64 59 32 | 9239 | 66 47 1 | 9237 |
| | α Pegasi E. | 47 54 39 | 9657 | 46 25 37 | 9105 | 44 57 34 | 9161 | 43 30 38 | 9225 |
| | α Arietis E. | 87 8 20 | 9233 | 85 23 8 | 9231 | 83 37 53 | 9230 | 81 52 37 | 9230 |
| | Aldebaran E. | 117 37 34 | 9256 | 115 50 30 | 9253 | 114 3 21 | 9251 | 112 16 9 | 9249 |
| 25 | Spica W. | 121 36 33 | 9251 | 123 23 45 | 9253 | 125 10 54 | 9255 | 126 58 0 | 9258 |
| | Antares W. | 75 44 55 | 9235 | 77 32 31 | 9235 | 79 20 7 | 9236 | 81 7 41 | 9237 |
| | α Arietis E. | 73 6 26 | 9236 | 71 21 19 | 9239 | 69 36 17 | 9243 | 67 51 20 | 9247 |
| | Aldebaran E. | 103 19 35 | 9245 | 101 32 14 | 9245 | 99 44 54 | 9246 | 97 57 35 | 9247 |
| | SUN E. | 129 33 59 | 9295 | 127 53 20 | 9295 | 126 12 42 | 9297 | 124 32 6 | 9297 |
| 26 | Antares W. | 90 4 55 | 9247 | 91 52 12 | 9251 | 93 39 24 | 9253 | 95 26 32 | 9257 |
| | α Aquilæ W. | 50 33 23 | 9753 | 51 49 14 | 9681 | 53 6 21 | 9617 | 54 24 37 | 9560 |
| | α Arietis E. | 59 8 29 | 9280 | 57 24 25 | 9289 | 55 40 34 | 9298 | 53 56 57 | 9409 |
| | Aldebaran E. | 89 1 34 | 9258 | 87 14 32 | 9261 | 85 27 35 | 9264 | 83 40 42 | 9268 |
| | SUN E. | 116 9 39 | 9238 | 114 29 19 | 9242 | 112 49 4 | 9245 | 111 8 54 | 9248 |
| 27 | Antares W. | 104 20 48 | 9278 | 106 7 20 | 9283 | 107 53 45 | 9287 | 109 40 3 | 9293 |
| | α Aquilæ W. | 61 9 50 | 9347 | 62 33 7 | 9318 | 63 56 58 | 9291 | 65 21 20 | 9296 |
| | α Arietis E. | 45 23 10 | 9480 | 43 41 29 | 9199 | 42 0 15 | 9290 | 40 19 30 | 9243 |
| | Aldebaran E. | 74 47 44 | 9289 | 73 1 28 | 9294 | 71 15 19 | 9299 | 69 29 18 | 9304 |
| | SUN E. | 102 49 21 | 9570 | 101 9 45 | 9574 | 99 30 15 | 9580 | 97 50 52 | 9585 |
| 28 | Antares W. | 118 29 34 | 9291 | 120 15 3 | 9297 | 122 0 23 | 9293 | 123 45 34 | 9299 |
| | α Aquilæ W. | 72 29 14 | 9184 | 73 55 42 | 9175 | 75 22 21 | 9167 | 76 49 10 | 9160 |
| | Fomalhaut W. | 37 51 36 | 9771 | 39 26 42 | 9742 | 41 2 26 | 9719 | 42 38 41 | 9698 |
| | Aldebaran E. | 60 41 17 | 9235 | 58 56 8 | 9241 | 57 11 8 | 9248 | 55 26 18 | 9255 |
| | VENUS E. | 67 39 22 | 9697 | 66 2 38 | 9704 | 64 26 3 | 9710 | 62 49 36 | 9716 |
| | SUN E. | 89 35 49 | 9613 | 87 57 12 | 9619 | 86 18 43 | 9626 | 84 40 23 | 9632 |
| 29 | α Aquilæ W. | 84 4 35 | 9151 | 85 31 43 | 9153 | 86 58 48 | 9157 | 88 25 49 | 9163 |
| | Fomalhaut W. | 50 45 29 | 9637 | 52 23 34 | 9629 | 54 1 49 | 9624 | 55 40 11 | 9620 |
| | α Pegasi W. | 36 57 35 | 9681 | 38 14 42 | 9587 | 39 33 30 | 9566 | 40 53 48 | 9434 |
| | Aldebaran E. | 46 44 52 | 9295 | 45 1 10 | 9404 | 43 17 41 | 9413 | 41 34 25 | 9423 |
| | VENUS E. | 54 49 34 | 9750 | 53 14 1 | 9757 | 51 38 37 | 9765 | 50 3 23 | 9772 |
| | SUN E. | 76 30 52 | 9665 | 74 53 25 | 9672 | 73 16 7 | 9678 | 71 38 58 | 9686 |
| 30 | α Aquilæ W. | 95 38 48 | 9207 | 97 4 49 | 9220 | 98 30 34 | 9224 | 99 56 3 | 9250 |
| | Fomalhaut W. | 63 52 58 | 9614 | 65 31 34 | 9615 | 67 10 8 | 9618 | 68 48 39 | 9620 |
| | α Pegasi W. | 47 52 36 | 9188 | 49 19 0 | 9155 | 50 46 3 | 9126 | 52 13 41 | 9101 |
| | Aldebaran E. | 33 1 53 | 9483 | 31 20 16 | 9498 | 29 39 0 | 9515 | 27 58 7 | 9539 |
| | VENUS E. | 42 9 37 | 9810 | 40 35 22 | 9818 | 39 1 18 | 9826 | 37 27 24 | 9835 |
| | SUN E. | 63 35 40 | 9722 | 61 59 30 | 9730 | 60 23 30 | 9738 | 58 47 41 | 9746 |

AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | Sidereal Time of Semi-diameter Passing Meridian. | Equation of Time, to be Added to Apparent Time. | Diff. for 1 Hour. |
|------------------|-------------------|---|-------------------|-----------------------|-------------------|----------------|--|---|-------------------|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | Semi-diameter. | | | |
| Wed. | 1 | ^h 6 ^m 40 ^s 33.06 | 10.343 | N. 23° 7' 36.8 | -10.01 | 15' 46".12 | 68.79 | ^m 3 ^s 31.97 | 0.485 |
| Thur. | 2 | 6 44 41.18 | 10.333 | 23 3 24.3 | 11.02 | 15 46.11 | 68.75 | 3 43.50 | 0.475 |
| Frid. | 3 | 6 48 49.05 | 10.322 | 22 58 47.6 | 12.02 | 15 46.10 | 68.71 | 3 54.78 | 0.464 |
| Sat. | 4 | 6 52 56.63 | 10.309 | 22 53 46.9 | -13.02 | 15 46.10 | 68.67 | 4 5.78 | 0.451 |
| SUN. | 5 | 6 57 3.91 | 10.296 | 22 48 22.2 | 14.02 | 15 46.11 | 68.62 | 4 16.47 | 0.438 |
| Mon. | 6 | 7 1 10.86 | 10.282 | 22 42 33.7 | 15.01 | 15 46.12 | 68.57 | 4 26.83 | 0.424 |
| Tues. | 7 | 7 5 17.45 | 10.267 | 22 36 21.5 | -16.00 | 15 46.13 | 68.52 | 4 36.84 | 0.409 |
| Wed. | 8 | 7 9 23.67 | 10.251 | 22 29 45.8 | 16.97 | 15 46.16 | 68.47 | 4 46.47 | 0.393 |
| Thur. | 9 | 7 13 29.48 | 10.234 | 22 22 46.7 | 17.94 | 15 46.19 | 68.41 | 4 55.70 | 0.376 |
| Frid. | 10 | 7 17 34.88 | 10.216 | 22 15 24.4 | -18.90 | 15 46.22 | 68.35 | 5 4.51 | 0.358 |
| Sat. | 11 | 7 21 39.83 | 10.197 | 22 7 39.1 | 19.85 | 15 46.26 | 68.29 | 5 12.88 | 0.339 |
| SUN. | 12 | 7 25 44.32 | 10.177 | 21 59 30.9 | 20.79 | 15 46.30 | 68.23 | 5 20.80 | 0.319 |
| Mon. | 13 | 7 29 48.34 | 10.157 | 21 51 0.0 | -21.73 | 15 46.35 | 68.16 | 5 28.24 | 0.299 |
| Tues. | 14 | 7 33 51.86 | 10.136 | 21 42 6.7 | 22.66 | 15 46.40 | 68.10 | 5 35.18 | 0.278 |
| Wed. | 15 | 7 37 54.88 | 10.115 | 21 32 51.3 | 23.58 | 15 46.46 | 68.03 | 5 41.62 | 0.257 |
| Thur. | 16 | 7 41 57.38 | 10.093 | 21 23 13.9 | -24.50 | 15 46.52 | 67.96 | 5 47.54 | 0.235 |
| Frid. | 17 | 7 45 59.35 | 10.071 | 21 13 14.8 | 25.41 | 15 46.59 | 67.89 | 5 52.94 | 0.213 |
| Sat. | 18 | 7 50 0.78 | 10.048 | 21 2 54.1 | 26.30 | 15 46.66 | 67.82 | 5 57.80 | 0.191 |
| SUN. | 19 | 7 54 1.66 | 10.025 | 20 52 12.1 | -27.19 | 15 46.73 | 67.74 | 6 2.11 | 0.168 |
| Mon. | 20 | 7 58 1.98 | 10.002 | 20 41 9.0 | 28.06 | 15 46.81 | 67.66 | 6 5.87 | 0.145 |
| Tues. | 21 | 8 2 1.75 | 9.979 | 20 29 45.1 | 28.92 | 15 46.89 | 67.58 | 6 9.07 | 0.122 |
| Wed. | 22 | 8 6 0.96 | 9.955 | 20 18 0.6 | -29.78 | 15 46.97 | 67.50 | 6 11.71 | 0.098 |
| Thur. | 23 | 8 9 59.60 | 9.931 | 20 5 55.7 | 30.62 | 15 47.05 | 67.42 | 6 13.79 | 0.074 |
| Frid. | 24 | 8 13 57.67 | 9.908 | 19 53 30.6 | 31.45 | 15 47.14 | 67.34 | 6 15.31 | 0.051 |
| Sat. | 25 | 8 17 55.16 | 9.884 | 19 40 45.7 | -32.27 | 15 47.23 | 67.25 | 6 16.25 | 0.027 |
| SUN. | 26 | 8 21 52.08 | 9.860 | 19 27 41.2 | 33.08 | 15 47.32 | 67.17 | 6 16.61 | 0.003 |
| Mon. | 27 | 8 25 48.43 | 9.836 | 19 14 17.3 | 33.88 | 15 47.42 | 67.08 | 6 16.40 | 0.021 |
| Tues. | 28 | 8 29 44.20 | 9.812 | 19 0 34.2 | -34.68 | 15 47.52 | 67.00 | 6 15.62 | 0.045 |
| Wed. | 29 | 8 33 39.39 | 9.788 | 18 46 32.2 | 35.46 | 15 47.63 | 66.91 | 6 14.26 | 0.069 |
| Thur. | 30 | 8 37 34.00 | 9.764 | 18 32 11.7 | 36.23 | 15 47.74 | 66.82 | 6 12.31 | 0.093 |
| Frid. | 31 | 8 41 28.01 | 9.739 | 18 17 32.8 | 36.99 | 15 47.85 | 66.73 | 6 9.76 | 0.118 |
| Sat. | 32 | 8 45 21.43 | 9.714 | N. 18 2 35.9 | -37.74 | 15 47.97 | 66.64 | 6 6.63 | 0.143 |

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.19 from the sidereal time.

The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, to be Subtracted from Mean Time. | Diff. for 1 Hour. | Sidereal Time, or Right Ascension of Mean Sun. |
|------------------|-------------------|---|-------------------|-----------------------|-------------------|--|-------------------|--|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | | | |
| Wed. | 1 | ^h 6 ^m 40 ^s 32.45 | 10.342 | N. 23° 7' 37.4" | -10.01 | ^m 3 ^s 31.94 | 0.485 | ^h 6 ^m 37 ^s 0.51 |
| Thur. | 2 | 6 44 40.54 | 10.332 | 23 3 25.0 | 11.02 | 3 43.47 | 0.475 | 6 40 57.07 |
| Frid. | 3 | 6 48 48.38 | 10.321 | 22 58 48.4 | 12.02 | 3 54.75 | 0.464 | 6 44 53.63 |
| Sat. | 4 | 6 52 55.93 | 10.308 | 22 53 47.8 | -13.03 | 4 5.75 | 0.451 | 6 48 50.18 |
| SUN. | 5 | 6 57 3.18 | 10.295 | 22 48 23.2 | 14.02 | 4 16.44 | 0.438 | 6 52 46.74 |
| Mon. | 6 | 7 1 10.10 | 10.281 | 22 42 34.8 | 15.01 | 4 26.80 | 0.424 | 6 56 43.30 |
| Tues. | 7 | 7 5 16.67 | 10.266 | 22 36 22.7 | -16.00 | 4 36.81 | 0.409 | 7 0 39.86 |
| Wed. | 8 | 7 9 22.86 | 10.250 | 22 29 47.1 | 16.97 | 4 46.44 | 0.393 | 7 4 36.42 |
| Thur. | 9 | 7 13 28.65 | 10.233 | 22 22 48.1 | 17.94 | 4 55.67 | 0.376 | 7 8 32.98 |
| Frid. | 10 | 7 17 34.02 | 10.215 | 22 15 25.9 | -18.90 | 5 4.48 | 0.358 | 7 12 29.54 |
| Sat. | 11 | 7 21 38.95 | 10.196 | 22 7 40.7 | 19.85 | 5 12.85 | 0.339 | 7 16 26.10 |
| SUN. | 12 | 7 25 43.42 | 10.176 | 21 59 32.7 | 20.79 | 5 20.77 | 0.319 | 7 20 22.65 |
| Mon. | 13 | 7 29 47.42 | 10.156 | 21 51 2.0 | -21.73 | 5 28.21 | 0.299 | 7 24 19.21 |
| Tues. | 14 | 7 33 50.92 | 10.135 | 21 42 8.9 | 22.66 | 5 35.15 | 0.278 | 7 28 15.77 |
| Wed. | 15 | 7 37 53.92 | 10.114 | 21 32 53.6 | 23.58 | 5 41.59 | 0.257 | 7 32 12.33 |
| Thur. | 16 | 7 41 56.40 | 10.092 | 21 23 16.4 | -24.50 | 5 47.52 | 0.235 | 7 36 8.88 |
| Frid. | 17 | 7 45 58.36 | 10.070 | 21 13 17.4 | 25.41 | 5 52.92 | 0.213 | 7 40 5.44 |
| Sat. | 18 | 7 49 59.78 | 10.048 | 21 2 56.8 | 26.30 | 5 57.78 | 0.191 | 7 44 2.00 |
| SUN. | 19 | 7 54 0.65 | 10.025 | 20 52 14.9 | -27.19 | 6 2.10 | 0.168 | 7 47 58.55 |
| Mon. | 20 | 7 58 0.97 | 10.002 | 20 41 11.9 | 28.06 | 6 5.86 | 0.145 | 7 51 55.11 |
| Tues. | 21 | 8 2 0.73 | 9.978 | 20 29 48.1 | 28.92 | 6 9.06 | 0.122 | 7 55 51.67 |
| Wed. | 22 | 8 5 59.93 | 9.955 | 20 18 3.7 | -29.78 | 6 11.70 | 0.098 | 7 59 48.23 |
| Thur. | 23 | 8 9 58.57 | 9.931 | 20 5 58.9 | 30.62 | 6 13.78 | 0.074 | 8 3 44.79 |
| Frid. | 24 | 8 13 56.64 | 9.908 | 19 53 33.9 | 31.45 | 6 15.30 | 0.051 | 8 7 41.34 |
| Sat. | 25 | 8 17 54.14 | 9.884 | 19 40 49.1 | -32.27 | 6 16.24 | 0.027 | 8 11 37.90 |
| SUN. | 26 | 8 21 51.06 | 9.860 | 19 27 44.7 | 33.08 | 6 16.60 | 0.003 | 8 15 34.46 |
| Mon. | 27 | 8 25 47.41 | 9.836 | 19 14 20.8 | 33.88 | 6 16.40 | 0.021 | 8 19 31.01 |
| Tues. | 28 | 8 29 43.19 | 9.812 | 19 0 37.8 | -34.68 | 6 15.62 | 0.045 | 8 23 27.57 |
| Wed. | 29 | 8 33 38.38 | 9.788 | 18 46 35.9 | 35.46 | 6 14.26 | 0.069 | 8 27 24.12 |
| Thur. | 30 | 8 37 32.99 | 9.764 | 18 32 15.4 | 36.23 | 6 12.31 | 0.093 | 8 31 20.68 |
| Frid. | 31 | 8 41 27.01 | 9.739 | 18 17 36.6 | 36.99 | 6 9.77 | 0.118 | 8 35 17.24 |
| Sat. | 32 | 8 45 20.44 | 9.714 | N. 18 2 39.7 | -37.74 | 6 6.64 | 0.143 | 8 39 13.80 |

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
 The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,
 +9°.8565.
 (Table III.)

| AT GREENWICH MEAN NOON. | | | | | | | | | |
|--|------------------|-----------------|------------|-------------------|----------|-----------|--|-------------------|---|
| Day of the Month. | Day of the Year. | THE SUN'S | | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 Hour. | Mean Time of Sidereal Noon. |
| | | TRUE LONGITUDE. | | Diff. for 1 Hour. | LATITUDE | | | | |
| | | λ | λ' | | | | | | |
| 1 | 182 | 99° 19' 7.4 | 18' 57.4 | 143.02 | — 0.10 | 0.0072289 | + 2.6 | 17 20 8.62 | |
| 2 | 183 | 100 16 19.9 | 16 9.7 | 143.02 | + 0.02 | 0.0072341 | 1.6 | 17 16 12.70 | |
| 3 | 184 | 101 13 32.6 | 13 22.2 | 143.03 | 0.15 | 0.0072369 | + 0.6 | 17 12 16.79 | |
| 4 | 185 | 102 10 45.5 | 10 34.9 | 143.03 | + 0.29 | 0.0072372 | — 0.4 | 17 8 20.88 | |
| 5 | 186 | 103 7 58.5 | 7 47.8 | 143.03 | 0.41 | 0.0072349 | 1.5 | 17 4 24.97 | |
| 6 | 187 | 104 5 11.6 | 5 0.7 | 143.03 | 0.51 | 0.0072299 | 2.6 | 17 0 29.06 | |
| 7 | 188 | 105 2 24.9 | 2 13.8 | 143.04 | + 0.60 | 0.0072222 | — 3.7 | 16 56 33.15 | |
| 8 | 189 | 105 59 38.2 | 59 26.9 | 143.05 | 0.67 | 0.0072119 | 4.8 | 16 52 37.24 | |
| 9 | 190 | 106 56 51.6 | 56 40.1 | 143.06 | 0.70 | 0.0071990 | 5.9 | 16 48 41.32 | |
| 10 | 191 | 107 54 5.1 | 53 53.4 | 143.06 | + 0.70 | 0.0071836 | — 6.9 | 16 44 45.40 | |
| 11 | 192 | 108 51 18.6 | 51 6.7 | 143.06 | 0.67 | 0.0071657 | 7.9 | 16 40 49.49 | |
| 12 | 193 | 109 48 32.0 | 48 20.0 | 143.06 | 0.62 | 0.0071455 | 8.9 | 16 36 53.58 | |
| 13 | 194 | 110 45 45.4 | 45 33.3 | 143.06 | + 0.54 | 0.0071231 | — 9.8 | 16 32 57.67 | |
| 14 | 195 | 111 42 58.9 | 42 46.6 | 143.06 | 0.44 | 0.0070985 | 10.7 | 16 29 1.75 | |
| 15 | 196 | 112 40 12.6 | 40 0.0 | 143.07 | 0.31 | 0.0070719 | 11.5 | 16 25 5.84 | |
| 16 | 197 | 113 37 26.3 | 37 13.5 | 143.07 | + 0.18 | 0.0070436 | — 12.2 | 16 21 9.93 | |
| 17 | 198 | 114 34 40.2 | 34 27.2 | 143.08 | + 0.05 | 0.0070136 | 12.8 | 16 17 14.02 | |
| 18 | 199 | 115 31 54.4 | 31 41.2 | 143.10 | — 0.08 | 0.0069821 | 13.5 | 16 13 18.12 | |
| 19 | 200 | 116 29 9.0 | 28 55.7 | 143.12 | — 0.21 | 0.0069491 | — 14.1 | 16 9 22.21 | |
| 20 | 201 | 117 26 24.0 | 26 10.5 | 143.13 | 0.32 | 0.0069147 | 14.7 | 16 5 26.30 | |
| 21 | 202 | 118 23 39.4 | 23 25.7 | 143.15 | 0.40 | 0.0068789 | 15.2 | 16 1 30.39 | |
| 22 | 203 | 119 20 55.3 | 20 41.4 | 143.18 | — 0.45 | 0.0068417 | — 15.8 | 15 57 34.47 | |
| 23 | 204 | 120 18 11.9 | 17 57.9 | 143.21 | 0.48 | 0.0068031 | 16.4 | 15 53 38.56 | |
| 24 | 205 | 121 15 29.4 | 15 15.2 | 143.24 | 0.48 | 0.0067631 | 17.0 | 15 49 42.65 | |
| 25 | 206 | 122 12 47.7 | 12 33.4 | 143.28 | — 0.45 | 0.0067217 | — 17.6 | 15 45 46.74 | |
| 26 | 207 | 123 10 6.9 | 9 52.4 | 143.32 | 0.39 | 0.0066788 | 18.2 | 15 41 50.82 | |
| 27 | 208 | 124 7 27.1 | 7 12.4 | 143.36 | 0.30 | 0.0066343 | 18.9 | 15 37 54.91 | |
| 28 | 209 | 125 4 48.4 | 4 33.6 | 143.40 | — 0.19 | 0.0065880 | — 19.7 | 15 33 59.00 | |
| 29 | 210 | 126 2 10.8 | 1 55.9 | 143.45 | — 0.07 | 0.0065398 | 20.5 | 15 30 3.09 | |
| 30 | 211 | 126 59 34.3 | 59 19.2 | 143.49 | + 0.06 | 0.0064896 | 21.3 | 15 26 7.18 | |
| 31 | 212 | 127 56 58.8 | 56 43.5 | 143.54 | 0.19 | 0.0064373 | 22.2 | 15 22 11.27 | |
| 32 | 213 | 128 54 24.4 | 54 8.9 | 143.59 | + 0.31 | 0.0063828 | — 23.1 | 15 18 15.36 | |
| NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^d .0. | | | | | | | | | Diff. for 1 Hour, — 9 ^s .8296. (Table II.) |

GREENWICH MEAN TIME.

THE MOON'S

| Day of the Month. | SEMI- DIAMETER. | | HORIZONTAL PARALLAX. | | | | UPPER TRANSIT. | | AGE. |
|-------------------|-----------------|-----------|----------------------|-------------------|-----------|-------------------|---------------------------|-------------------|--------------|
| | Noon. | Midnight. | Noon. | Diff. for 1 Hour. | Midnight. | Diff. for 1 Hour. | Meridian of Greenwich. | Diff. for 1 Hour. | Noon. |
| | | | | | | | ^h ^m | ^m | ^d |
| 1 | 15 54.3 | 15 50.7 | 58 15.8 | -1.07 | 58 2.7 | -1.11 | 20 46.7 | 2.15 | 24.8 |
| 2 | 15 47.0 | 15 43.2 | 57 49.1 | 1.16 | 57 35.0 | 1.20 | 21 39.4 | 2.23 | 25.8 |
| 3 | 15 39.3 | 15 35.2 | 57 20.4 | 1.24 | 57 5.4 | 1.27 | 22 33.9 | 2.29 | 26.8 |
| 4 | 15 31.0 | 15 26.8 | 56 50.1 | -1.29 | 56 34.6 | -1.30 | 23 29.4 | 2.30 | 27.8 |
| 5 | 15 22.5 | 15 18.3 | 56 19.0 | 1.30 | 56 3.4 | 1.29 | 0 24.3 | | 28.8 |
| 6 | 15 14.1 | 15 10.0 | 55 48.0 | 1.27 | 55 33.1 | 1.23 | 0 24.3 | 2.24 | 0.3 |
| 7 | 15 6.1 | 15 2.4 | 55 18.7 | -1.17 | 55 5.1 | -1.10 | 1 17.1 | 2.13 | 1.3 |
| 8 | 14 59.0 | 14 55.9 | 54 52.5 | 1.00 | 54 41.1 | 0.90 | 2 6.8 | 2.00 | 2.3 |
| 9 | 14 53.1 | 14 50.9 | 54 31.1 | 0.77 | 54 22.8 | 0.62 | 2 53.3 | 1.87 | 3.3 |
| 10 | 14 49.1 | 14 47.9 | 54 16.3 | -0.46 | 54 11.8 | -0.29 | 3 36.8 | 1.77 | 4.3 |
| 11 | 14 47.3 | 14 47.2 | 54 9.5 | -0.11 | 54 9.4 | +0.10 | 4 18.1 | 1.69 | 5.3 |
| 12 | 14 47.9 | 14 49.2 | 54 11.8 | +0.30 | 54 16.6 | 0.51 | 4 58.1 | 1.66 | 6.3 |
| 13 | 14 51.2 | 14 53.9 | 54 24.0 | +0.73 | 54 34.0 | +0.94 | 5 38.0 | 1.68 | 7.3 |
| 14 | 14 57.3 | 15 1.4 | 54 46.5 | 1.15 | 55 1.4 | 1.35 | 6 18.7 | 1.74 | 8.3 |
| 15 | 15 6.1 | 15 11.3 | 55 18.7 | 1.54 | 55 38.1 | 1.70 | 7 1.6 | 1.86 | 9.3 |
| 16 | 15 17.2 | 15 23.5 | 55 59.5 | +1.86 | 56 22.6 | +1.98 | 7 47.8 | 2.01 | 10.3 |
| 17 | 15 30.1 | 15 37.0 | 56 47.0 | 2.08 | 57 12.3 | 2.14 | 8 38.1 | 2.20 | 11.3 |
| 18 | 15 44.1 | 15 51.0 | 57 38.1 | 2.16 | 58 3.8 | 2.13 | 9 33.2 | 2.36 | 12.3 |
| 19 | 15 57.9 | 16 4.4 | 58 29.0 | +2.05 | 58 53.0 | +1.94 | 10 32.5 | 2.52 | 13.3 |
| 20 | 16 10.5 | 16 16.0 | 59 15.4 | 1.77 | 59 35.5 | 1.56 | 11 34.3 | 2.58 | 14.3 |
| 21 | 16 20.7 | 16 24.6 | 59 52.8 | 1.32 | 60 6.9 | 1.04 | 12 36.1 | 2.53 | 15.3 |
| 22 | 16 27.5 | 16 29.4 | 60 17.6 | +0.75 | 60 24.7 | +0.44 | 13 35.8 | 2.41 | 16.3 |
| 23 | 16 30.3 | 16 30.2 | 60 27.9 | +0.13 | 60 27.6 | -0.18 | 14 32.1 | 2.28 | 17.3 |
| 24 | 16 29.1 | 16 27.2 | 60 23.7 | -0.46 | 60 16.6 | 0.72 | 15 25.1 | 2.16 | 18.3 |
| 25 | 16 24.5 | 16 21.1 | 60 6.5 | -0.94 | 59 54.1 | -1.13 | 16 15.6 | 2.07 | 19.3 |
| 26 | 16 17.1 | 16 12.7 | 59 39.6 | 1.28 | 59 23.4 | 1.40 | 17 4.7 | 2.04 | 20.3 |
| 27 | 16 8.0 | 16 3.1 | 59 6.0 | 1.48 | 58 47.9 | 1.54 | 17 53.8 | 2.06 | 21.3 |
| 28 | 15 58.0 | 15 52.8 | 58 29.3 | -1.57 | 58 10.4 | -1.57 | 18 43.8 | 2.12 | 22.3 |
| 29 | 15 47.8 | 15 42.7 | 57 51.7 | 1.56 | 57 33.1 | 1.54 | 19 35.5 | 2.19 | 23.3 |
| 30 | 15 37.8 | 15 33.0 | 57 15.0 | 1.49 | 56 57.4 | 1.45 | 20 28.9 | 2.25 | 24.3 |
| 31 | 15 28.3 | 15 23.9 | 56 40.4 | 1.40 | 56 24.0 | 1.35 | 21 23.4 | 2.27 | 25.3 |
| 32 | 15 19.6 | 15 15.5 | 56 8.2 | -1.20 | 55 53.1 | -1.24 | 22 17.8 | 2.24 | 26.3 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|-----------------|---------------------|-------------|------------------|---------------------|-----------------|---------------------|
| WEDNESDAY 1. | | | | | FRIDAY 3. | | | | |
| 0 | 2 41 19.23 | 2.1736 | N.13° 33' 17.9" | 13.106 | 0 | 4 29 20.68 | 2.3988 | N.22° 11' 24.0" | 8.062 |
| 1 | 2 43 29.73 | 2.1764 | 13 46 21.9 | 13.097 | 1 | 4 31 40.50 | 2.3317 | 22 19 23.8 | 7.992 |
| 2 | 2 45 40.40 | 2.1792 | 13 59 21.2 | 12.948 | 2 | 4 34 0.49 | 2.3346 | 22 27 15.8 | 7.802 |
| 3 | 2 47 51.24 | 2.1822 | 14 12 15.7 | 12.868 | 3 | 4 36 20.65 | 2.3374 | 22 35 0.0 | 7.670 |
| 4 | 2 50 2.26 | 2.1852 | 14 25 5.3 | 12.786 | 4 | 4 38 40.98 | 2.3402 | 22 42 36.2 | 7.538 |
| 5 | 2 52 13.46 | 2.1882 | 14 37 50.0 | 12.703 | 5 | 4 41 1.47 | 2.3432 | 22 50 4.5 | 7.405 |
| 6 | 2 54 24.84 | 2.1912 | 14 50 29.6 | 12.618 | 6 | 4 43 22.13 | 2.3456 | 22 57 24.8 | 7.271 |
| 7 | 2 56 36.40 | 2.1942 | 15 3 4.1 | 12.533 | 7 | 4 45 42.95 | 2.3482 | 23 4 37.0 | 7.136 |
| 8 | 2 58 48.15 | 2.1973 | 15 15 33.5 | 12.446 | 8 | 4 48 3.92 | 2.3508 | 23 11 41.1 | 7.000 |
| 9 | 3 1 0.08 | 2.2004 | 15 27 57.6 | 12.358 | 9 | 4 50 25.05 | 2.3533 | 23 18 37.0 | 6.863 |
| 10 | 3 3 12.20 | 2.2036 | 15 40 16.4 | 12.269 | 10 | 4 52 46.32 | 2.3558 | 23 25 24.7 | 6.726 |
| 11 | 3 5 24.51 | 2.2068 | 15 52 29.9 | 12.179 | 11 | 4 55 7.74 | 2.3582 | 23 32 4.2 | 6.589 |
| 12 | 3 7 37.02 | 2.2101 | 16 4 37.9 | 12.087 | 12 | 4 57 29.30 | 2.3606 | 23 38 35.4 | 6.451 |
| 13 | 3 9 49.72 | 2.2133 | 16 16 40.3 | 11.994 | 13 | 4 59 51.00 | 2.3627 | 23 44 58.3 | 6.312 |
| 14 | 3 12 2.62 | 2.2166 | 16 28 37.1 | 11.900 | 14 | 5 2 12.83 | 2.3649 | 23 51 12.8 | 6.172 |
| 15 | 3 14 15.71 | 2.2198 | 16 40 28.3 | 11.806 | 15 | 5 4 34.79 | 2.3670 | 23 57 19.0 | 6.032 |
| 16 | 3 16 29.00 | 2.2231 | 16 52 13.8 | 11.710 | 16 | 5 6 56.87 | 2.3690 | 24 3 16.7 | 5.892 |
| 17 | 3 18 42.49 | 2.2264 | 17 3 53.5 | 11.612 | 17 | 5 9 19.07 | 2.3710 | 24 9 6.0 | 5.751 |
| 18 | 3 20 56.17 | 2.2298 | 17 15 27.3 | 11.513 | 18 | 5 11 41.39 | 2.3729 | 24 14 46.8 | 5.609 |
| 19 | 3 23 10.06 | 2.2332 | 17 26 55.1 | 11.413 | 19 | 5 14 3.82 | 2.3747 | 24 20 19.0 | 5.466 |
| 20 | 3 25 24.15 | 2.2365 | 17 38 16.9 | 11.313 | 20 | 5 16 26.36 | 2.3764 | 24 25 42.7 | 5.323 |
| 21 | 3 27 38.44 | 2.2399 | 17 49 32.7 | 11.212 | 21 | 5 18 48.99 | 2.3780 | 24 30 57.8 | 5.180 |
| 22 | 3 29 52.94 | 2.2433 | 18 0 42.4 | 11.109 | 22 | 5 21 11.72 | 2.3796 | 24 36 4.3 | 5.036 |
| 23 | 3 32 7.64 | 2.2467 | N.18 11 45.8 | 11.004 | 23 | 5 23 34.55 | 2.3812 | N.24 41 2.1 | 4.892 |
| THURSDAY 2. | | | | | SATURDAY 4. | | | | |
| 0 | 3 34 22.55 | 2.2502 | N.18 22 42.9 | 10.898 | 0 | 5 25 57.47 | 2.3827 | N.24 45 51.3 | 4.747 |
| 1 | 3 36 37.66 | 2.2536 | 18 33 33.6 | 10.792 | 1 | 5 28 20.47 | 2.3839 | 24 50 31.8 | 4.602 |
| 2 | 3 38 52.98 | 2.2570 | 18 44 18.0 | 10.686 | 2 | 5 30 43.54 | 2.3851 | 24 55 3.5 | 4.456 |
| 3 | 3 41 8.50 | 2.2604 | 18 54 55.9 | 10.577 | 3 | 5 33 6.68 | 2.3862 | 24 59 26.5 | 4.310 |
| 4 | 3 43 24.23 | 2.2638 | 19 5 27.2 | 10.467 | 4 | 5 35 29.89 | 2.3873 | 25 3 40.7 | 4.164 |
| 5 | 3 45 40.16 | 2.2672 | 19 15 51.9 | 10.357 | 5 | 5 37 53.16 | 2.3889 | 25 7 46.2 | 4.018 |
| 6 | 3 47 56.29 | 2.2706 | 19 26 10.0 | 10.245 | 6 | 5 40 16.48 | 2.3891 | 25 11 42.9 | 3.871 |
| 7 | 3 50 12.63 | 2.2740 | 19 36 21.3 | 10.132 | 7 | 5 42 39.85 | 2.3899 | 25 15 30.7 | 3.724 |
| 8 | 3 52 29.17 | 2.2774 | 19 46 25.8 | 10.018 | 8 | 5 45 3.27 | 2.3907 | 25 19 9.7 | 3.577 |
| 9 | 3 54 45.92 | 2.2808 | 19 56 23.5 | 9.903 | 9 | 5 47 26.73 | 2.3912 | 25 22 39.9 | 3.430 |
| 10 | 3 57 2.87 | 2.2841 | 20 6 14.2 | 9.787 | 10 | 5 49 50.22 | 2.3917 | 25 26 1.3 | 3.282 |
| 11 | 3 59 20.01 | 2.2874 | 20 15 57.9 | 9.670 | 11 | 5 52 13.73 | 2.3920 | 25 29 13.7 | 3.133 |
| 12 | 4 1 37.36 | 2.2908 | 20 25 34.6 | 9.552 | 12 | 5 54 37.26 | 2.3923 | 25 32 17.2 | 2.985 |
| 13 | 4 3 54.91 | 2.2942 | 20 35 4.2 | 9.433 | 13 | 5 57 0.80 | 2.3925 | 25 35 11.9 | 2.837 |
| 14 | 4 6 12.66 | 2.2974 | 20 44 26.6 | 9.313 | 14 | 5 59 24.36 | 2.3927 | 25 37 57.7 | 2.688 |
| 15 | 4 8 30.60 | 2.3007 | 20 53 41.8 | 9.193 | 15 | 6 1 47.92 | 2.3926 | 25 40 34.5 | 2.539 |
| 16 | 4 10 48.74 | 2.3039 | 21 2 49.7 | 9.071 | 16 | 6 4 11.47 | 2.3925 | 25 43 2.4 | 2.392 |
| 17 | 4 13 7.07 | 2.3072 | 21 11 50.3 | 8.947 | 17 | 6 6 35.02 | 2.3923 | 25 45 21.5 | 2.244 |
| 18 | 4 15 25.60 | 2.3104 | 21 20 43.4 | 8.823 | 18 | 6 8 58.55 | 2.3920 | 25 47 31.7 | 2.096 |
| 19 | 4 17 44.32 | 2.3135 | 21 29 29.1 | 8.699 | 19 | 6 11 22.06 | 2.3916 | 25 49 33.0 | 1.947 |
| 20 | 4 20 3.22 | 2.3166 | 21 38 7.3 | 8.574 | 20 | 6 13 45.54 | 2.3911 | 25 51 25.3 | 1.798 |
| 21 | 4 22 22.31 | 2.3197 | 21 46 36.0 | 8.447 | 21 | 6 16 8.99 | 2.3905 | 25 53 8.7 | 1.650 |
| 22 | 4 24 41.58 | 2.3227 | 21 55 1.0 | 8.320 | 22 | 6 18 32.40 | 2.3897 | 25 54 43.3 | 1.502 |
| 23 | 4 27 1.04 | 2.3258 | 22 3 16.4 | 8.192 | 23 | 6 20 55.76 | 2.3888 | 25 56 8.9 | 1.353 |
| 24 | 4 29 20.68 | 2.3288 | N.22 11 24.0 | 8.062 | 24 | 6 23 19.06 | 2.3879 | N.25 57 25.6 | 1.204 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-----------|------------------|---------------------|-----------------|---------------------|--------------|------------------|---------------------|----------------|---------------------|
| SUNDAY 5. | | | | | TUESDAY 7. | | | | |
| 0 | h m s | 2.3879 | N.25° 57' 25.6" | 1.304 | 0 | h m s | 2.9371 | N.24° 12' 5.0" | 5.354 |
| 1 | 6 23 19.06 | 2.3870 | 25 58 33.4 | 1.056 | 1 | 8 15 4.28 | 2.9399 | 24 6 40.2 | 5.479 |
| 2 | 6 28 5.50 | 2.3858 | 25 59 32.4 | 0.909 | 2 | 8 17 18.36 | 2.9374 | 24 1 8.3 | 5.590 |
| 3 | 6 30 28.61 | 2.3846 | 26 0 22.5 | 0.769 | 3 | 8 19 32.15 | 2.9325 | 23 55 29.4 | 5.706 |
| 4 | 6 32 51.65 | 2.3833 | 26 1 3.8 | 0.614 | 4 | 8 21 45.65 | 2.9176 | 23 49 43.6 | 5.891 |
| 5 | 6 35 14.61 | 2.3818 | 26 1 36.2 | 0.467 | 5 | 8 23 58.85 | 2.9176 | 23 43 50.9 | 5.936 |
| 6 | 6 37 37.47 | 2.3803 | 26 1 59.8 | 0.330 | 6 | 8 26 11.76 | 2.9076 | 23 37 51.3 | 6.050 |
| 7 | 6 40 0.24 | 2.3787 | 26 2 14.6 | 0.173 | 7 | 8 28 24.37 | 2.9025 | 23 31 44.9 | 6.169 |
| 8 | 6 42 22.91 | 2.3769 | 26 2 20.6 | + 0.027 | 8 | 8 30 36.67 | 2.1973 | 23 25 31.8 | 6.273 |
| 9 | 6 44 45.47 | 2.3751 | 26 2 17.8 | - 0.119 | 9 | 8 32 48.67 | 2.1994 | 23 19 12.1 | 6.383 |
| 10 | 6 47 7.92 | 2.3739 | 26 2 6.3 | 0.361 | 10 | 8 35 0.37 | 2.1879 | 23 12 45.8 | 6.493 |
| 11 | 6 49 30.25 | 2.3712 | 26 1 46.1 | 0.410 | 11 | 8 37 11.76 | 2.1891 | 23 6 12.9 | 6.604 |
| 12 | 6 51 52.46 | 2.3691 | 26 1 17.1 | 0.536 | 12 | 8 39 22.84 | 2.1769 | 22 59 33.6 | 6.708 |
| 13 | 6 54 14.54 | 2.3668 | 26 0 39.4 | 0.700 | 13 | 8 41 33.61 | 2.1718 | 22 52 47.9 | 6.815 |
| 14 | 6 56 36.48 | 2.3644 | 25 59 53.1 | 0.843 | 14 | 8 43 44.07 | 2.1666 | 22 45 55.8 | 6.922 |
| 15 | 6 58 58.27 | 2.3619 | 25 58 58.2 | 0.987 | 15 | 8 45 54.22 | 2.1613 | 22 38 57.3 | 7.027 |
| 16 | 7 1 19.91 | 2.3594 | 25 57 54.7 | 1.130 | 16 | 8 48 4.06 | 2.1561 | 22 31 52.6 | 7.130 |
| 17 | 7 3 41.40 | 2.3569 | 25 56 42.6 | 1.273 | 17 | 8 50 13.58 | 2.1509 | 22 24 41.7 | 7.233 |
| 18 | 7 6 2.74 | 2.3549 | 25 55 22.0 | 1.411 | 18 | 8 52 22.79 | 2.1456 | 22 17 24.8 | 7.333 |
| 19 | 7 8 23.91 | 2.3514 | 25 53 52.9 | 1.556 | 19 | 8 54 31.69 | 2.1403 | 22 10 1.8 | 7.433 |
| 20 | 7 10 44.91 | 2.3485 | 25 52 15.3 | 1.697 | 20 | 8 56 40.27 | 2.1351 | 22 2 32.8 | 7.539 |
| 21 | 7 13 5.73 | 2.3455 | 25 50 20.2 | 1.838 | 21 | 8 58 48.53 | 2.1298 | 21 54 57.9 | 7.631 |
| 22 | 7 15 26.37 | 2.3425 | 25 48 34.7 | 1.978 | 22 | 9 0 56.48 | 2.1245 | 21 47 17.1 | 7.728 |
| 23 | 7 17 46.83 | 2.3394 | N.25 46 31.9 | 2.117 | 23 | 9 3 4.11 | 2.1192 | N.21 39 30.5 | 7.825 |
| MONDAY 6. | | | | | WEDNESDAY 8. | | | | |
| 0 | 7 20 7.10 | 2.3362 | N.25 44 20.7 | 2.256 | 0 | 9 7 18.42 | 2.1140 | N.21 31 38.1 | 7.921 |
| 1 | 7 22 27.17 | 2.3338 | 25 42 1.2 | 2.394 | 1 | 9 9 25.10 | 2.1087 | 21 23 40.0 | 8.014 |
| 2 | 7 24 47.04 | 2.3294 | 25 39 33.5 | 2.531 | 2 | 9 11 31.46 | 2.1034 | 21 15 36.4 | 8.107 |
| 3 | 7 27 6.70 | 2.3259 | 25 36 57.5 | 2.668 | 3 | 9 13 37.51 | 2.0982 | 21 7 27.2 | 8.199 |
| 4 | 7 29 26.15 | 2.3223 | 25 34 13.3 | 2.804 | 4 | 9 15 43.24 | 2.0929 | 20 59 12.5 | 8.291 |
| 5 | 7 31 45.38 | 2.3187 | 25 31 21.0 | 2.938 | 5 | 9 17 48.66 | 2.0877 | 20 50 52.3 | 8.382 |
| 6 | 7 34 4.39 | 2.3150 | 25 28 20.7 | 3.079 | 6 | 9 19 53.77 | 2.0825 | 20 42 26.7 | 8.471 |
| 7 | 7 36 23.18 | 2.3112 | 25 25 12.3 | 3.206 | 7 | 9 21 58.56 | 2.0772 | 20 33 55.8 | 8.558 |
| 8 | 7 38 41.74 | 2.3073 | 25 21 55.9 | 3.340 | 8 | 9 24 3.04 | 2.0720 | 20 25 19.7 | 8.645 |
| 9 | 7 41 0.06 | 2.3034 | 25 18 31.5 | 3.472 | 9 | 9 26 7.20 | 2.0668 | 20 16 38.4 | 8.732 |
| 10 | 7 43 18.15 | 2.2995 | 25 14 59.2 | 3.603 | 10 | 9 28 11.05 | 2.0616 | 20 7 51.9 | 8.817 |
| 11 | 7 45 36.00 | 2.2954 | 25 11 19.1 | 3.733 | 11 | 9 30 14.59 | 2.0564 | 19 59 0.4 | 8.900 |
| 12 | 7 47 53.60 | 2.2913 | 25 7 31.2 | 3.863 | 12 | 9 32 17.82 | 2.0512 | 19 50 3.9 | 8.983 |
| 13 | 7 50 10.95 | 2.2871 | 25 3 35.5 | 3.992 | 13 | 9 34 20.74 | 2.0461 | 19 41 2.4 | 9.066 |
| 14 | 7 52 28.05 | 2.2828 | 24 59 32.1 | 4.121 | 14 | 9 36 23.35 | 2.0410 | 19 31 56.0 | 9.147 |
| 15 | 7 54 44.89 | 2.2785 | 24 55 21.0 | 4.248 | 15 | 9 38 25.66 | 2.0359 | 19 22 44.8 | 9.227 |
| 16 | 7 57 1.47 | 2.2741 | 24 51 2.3 | 4.375 | 16 | 9 40 27.66 | 2.0308 | 19 13 28.8 | 9.306 |
| 17 | 7 59 17.78 | 2.2696 | 24 46 36.0 | 4.500 | 17 | 9 42 29.36 | 2.0256 | 19 4 8.1 | 9.384 |
| 18 | 8 1 33.82 | 2.2651 | 24 42 2.3 | 4.624 | 18 | 9 44 30.76 | 2.0204 | 18 54 42.7 | 9.462 |
| 19 | 8 3 49.59 | 2.2606 | 24 37 21.1 | 4.748 | 19 | 9 46 31.86 | 2.0152 | 18 45 12.7 | 9.539 |
| 20 | 8 6 5.09 | 2.2560 | 24 32 32.5 | 4.872 | 20 | 9 48 32.66 | 2.0100 | 18 35 38.2 | 9.613 |
| 21 | 8 8 20.31 | 2.2513 | 24 27 36.5 | 4.994 | 21 | 9 50 33.16 | 2.0049 | 18 25 59.2 | 9.688 |
| 22 | 8 10 35.25 | 2.2467 | 24 22 33.2 | 5.115 | 22 | 9 52 33.37 | 2.0011 | 18 16 15.7 | 9.761 |
| 23 | 8 12 49.91 | 2.2419 | 24 17 22.7 | 5.235 | 23 | 9 54 33.20 | 1.9962 | 18 6 27.9 | 9.833 |
| 24 | 8 15 4.28 | 2.2371 | N.24 12 5.0 | 5.354 | 24 | 9 56 32.91 | 1.9913 | N.17 56 35.8 | 9.903 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|---------------------|---------------|---------------------|--------------|------------------|---------------------|--------------|---------------------|
| THURSDAY 9. | | | | | SATURDAY 11. | | | | |
| 0 | 9 56 32.91 | 1.9913 | N. 17 56 35.8 | 9.903 | 0 | 11 27 24.80 | 1.8151 | N. 8 55 53.7 | 12.311 |
| 1 | 9 58 32.24 | 1.9865 | 17 46 39.5 | 9.974 | 1 | 11 29 13.64 | 1.8198 | 8 43 34.1 | 12.342 |
| 2 | 10 0 31.29 | 1.9818 | 17 36 38.9 | 10.044 | 2 | 11 31 2.34 | 1.8106 | 8 31 12.6 | 12.373 |
| 3 | 10 2 30.06 | 1.9771 | 17 26 34.2 | 10.112 | 3 | 11 32 50.91 | 1.8085 | 8 18 49.3 | 12.403 |
| 4 | 10 4 28.54 | 1.9724 | 17 16 25.4 | 10.180 | 4 | 11 34 39.36 | 1.8065 | 8 6 24.3 | 12.439 |
| 5 | 10 6 26.74 | 1.9678 | 17 6 12.6 | 10.246 | 5 | 11 36 27.69 | 1.8045 | 7 53 57.5 | 12.461 |
| 6 | 10 8 24.67 | 1.9632 | 16 55 55.9 | 10.312 | 6 | 11 38 15.90 | 1.8025 | 7 41 29.0 | 12.488 |
| 7 | 10 10 22.32 | 1.9586 | 16 45 35.2 | 10.377 | 7 | 11 40 3.99 | 1.8007 | 7 28 58.9 | 12.515 |
| 8 | 10 12 19.70 | 1.9540 | 16 35 10.7 | 10.440 | 8 | 11 41 51.98 | 1.7989 | 7 16 27.2 | 12.542 |
| 9 | 10 14 16.80 | 1.9495 | 16 24 42.4 | 10.503 | 9 | 11 43 39.86 | 1.7973 | 7 3 53.9 | 12.567 |
| 10 | 10 16 13.64 | 1.9451 | 16 14 10.3 | 10.566 | 10 | 11 45 27.64 | 1.7955 | 6 51 19.1 | 12.592 |
| 11 | 10 18 10.21 | 1.9407 | 16 3 34.5 | 10.627 | 11 | 11 47 15.32 | 1.7938 | 6 38 42.8 | 12.617 |
| 12 | 10 20 6.52 | 1.9363 | 15 52 55.1 | 10.687 | 12 | 11 49 2.90 | 1.7922 | 6 26 5.0 | 12.641 |
| 13 | 10 22 2.57 | 1.9320 | 15 42 12.1 | 10.746 | 13 | 11 50 50.39 | 1.7908 | 6 13 25.9 | 12.664 |
| 14 | 10 23 58.36 | 1.9278 | 15 31 25.6 | 10.805 | 14 | 11 52 37.80 | 1.7895 | 6 0 45.4 | 12.687 |
| 15 | 10 25 53.90 | 1.9236 | 15 20 35.5 | 10.863 | 15 | 11 54 25.13 | 1.7889 | 5 48 3.5 | 12.709 |
| 16 | 10 27 49.19 | 1.9194 | 15 9 42.0 | 10.919 | 16 | 11 56 12.38 | 1.7889 | 5 35 20.3 | 12.730 |
| 17 | 10 29 44.23 | 1.9152 | 14 58 45.2 | 10.975 | 17 | 11 57 59.56 | 1.7888 | 5 22 35.9 | 12.750 |
| 18 | 10 31 39.02 | 1.9112 | 14 47 45.0 | 11.031 | 18 | 11 59 46.67 | 1.7847 | 5 9 50.3 | 12.770 |
| 19 | 10 33 33.57 | 1.9072 | 14 36 41.5 | 11.085 | 19 | 12 1 33.72 | 1.7836 | 4 57 3.5 | 12.789 |
| 20 | 10 35 27.88 | 1.9032 | 14 25 34.8 | 11.138 | 20 | 12 3 20.70 | 1.7825 | 4 44 15.6 | 12.808 |
| 21 | 10 37 21.96 | 1.8993 | 14 14 24.9 | 11.191 | 21 | 12 5 7.62 | 1.7816 | 4 31 26.5 | 12.827 |
| 22 | 10 39 15.80 | 1.8954 | 14 3 11.9 | 11.242 | 22 | 12 6 54.49 | 1.7807 | 4 18 36.4 | 12.843 |
| 23 | 10 41 9.41 | 1.8916 | N. 13 51 55.9 | 11.292 | 23 | 12 8 41.31 | 1.7799 | N. 4 5 45.3 | 12.859 |
| FRIDAY 10. | | | | | SUNDAY 12. | | | | |
| 0 | 10 43 2.80 | 1.8879 | N. 13 40 36.9 | 11.342 | 0 | 12 10 28.08 | 1.7792 | N. 3 52 53.3 | 12.875 |
| 1 | 10 44 55.96 | 1.8842 | 13 29 14.9 | 11.392 | 1 | 12 12 14.81 | 1.7786 | 3 40 0.3 | 12.891 |
| 2 | 10 46 48.90 | 1.8805 | 13 17 49.9 | 11.441 | 2 | 12 14 1.51 | 1.7781 | 3 27 6.3 | 12.907 |
| 3 | 10 48 41.02 | 1.8769 | 13 6 22.0 | 11.488 | 3 | 12 15 48.18 | 1.7776 | 3 14 11.5 | 12.921 |
| 4 | 10 50 34.13 | 1.8734 | 12 54 51.3 | 11.535 | 4 | 12 17 34.82 | 1.7773 | 3 1 15.8 | 12.934 |
| 5 | 10 52 26.43 | 1.8699 | 12 43 17.8 | 11.581 | 5 | 12 19 21.44 | 1.7768 | 2 48 19.4 | 12.947 |
| 6 | 10 54 18.52 | 1.8665 | 12 31 41.6 | 11.626 | 6 | 12 21 8.04 | 1.7765 | 2 35 22.2 | 12.959 |
| 7 | 10 56 10.41 | 1.8632 | 12 20 2.7 | 11.670 | 7 | 12 22 54.62 | 1.7763 | 2 22 24.3 | 12.971 |
| 8 | 10 58 2.10 | 1.8598 | 12 8 21.2 | 11.714 | 8 | 12 24 41.19 | 1.7762 | 2 9 25.7 | 12.982 |
| 9 | 10 59 53.59 | 1.8566 | 11 56 37.0 | 11.757 | 9 | 12 26 27.76 | 1.7761 | 1 56 26.4 | 12.993 |
| 10 | 11 1 44.89 | 1.8534 | 11 44 50.3 | 11.799 | 10 | 12 28 14.32 | 1.7761 | 1 43 26.5 | 13.003 |
| 11 | 11 3 36.00 | 1.8502 | 11 33 1.1 | 11.841 | 11 | 12 30 0.89 | 1.7762 | 1 30 26.0 | 13.012 |
| 12 | 11 5 26.92 | 1.8472 | 11 21 9.4 | 11.882 | 12 | 12 31 47.46 | 1.7763 | 1 17 25.0 | 13.021 |
| 13 | 11 7 17.66 | 1.8442 | 11 9 15.3 | 11.921 | 13 | 12 33 34.04 | 1.7765 | 1 4 23.5 | 13.029 |
| 14 | 11 9 8.22 | 1.8412 | 10 57 18.9 | 11.960 | 14 | 12 35 20.64 | 1.7768 | 0 51 21.5 | 13.037 |
| 15 | 11 10 58.61 | 1.8383 | 10 45 20.1 | 11.999 | 15 | 12 37 7.26 | 1.7772 | 0 38 19.1 | 13.043 |
| 16 | 11 12 48.82 | 1.8355 | 10 33 19.0 | 12.037 | 16 | 12 38 53.90 | 1.7776 | 0 25 16.3 | 13.049 |
| 17 | 11 14 38.87 | 1.8327 | 10 21 15.7 | 12.074 | 17 | 12 40 40.57 | 1.7781 | N. 0 12 13.2 | 13.054 |
| 18 | 11 16 28.75 | 1.8300 | 10 9 10.2 | 12.110 | 18 | 12 42 27.28 | 1.7787 | S. 0 0 50.2 | 13.059 |
| 19 | 11 18 18.47 | 1.8274 | 9 57 2.5 | 12.145 | 19 | 12 44 14.02 | 1.7793 | 0 13 53.9 | 13.063 |
| 20 | 11 20 8.04 | 1.8248 | 9 44 52.8 | 12.179 | 20 | 12 46 0.80 | 1.7801 | 0 26 57.8 | 13.067 |
| 21 | 11 21 57.45 | 1.8222 | 9 32 41.0 | 12.213 | 21 | 12 47 47.63 | 1.7809 | 0 40 1.9 | 13.070 |
| 22 | 11 23 46.71 | 1.8196 | 9 20 27.2 | 12.247 | 22 | 12 49 34.51 | 1.7818 | 0 53 6.2 | 13.073 |
| 23 | 11 25 35.83 | 1.8174 | 9 8 11.4 | 12.279 | 23 | 12 51 21.45 | 1.7827 | 1 6 10.6 | 13.074 |
| 24 | 11 27 24.80 | 1.8151 | N. 8 55 53.7 | 12.311 | 24 | 12 53 8.44 | 1.7838 | S. 1 19 15.1 | 13.075 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|---|---------------------|-----------------|---------------------|---------------|--|---------------------|-----------------|---------------------|
| MONDAY 13. | | | | | WEDNESDAY 15. | | | | |
| 0 | ^h 12 ^m 53 ^s 8.44 | 1.7838 | S. 1° 19' 15.1" | 13.075 | 0 | ^h 14 ^m 21 ^s 21.76 | 1.9219 | S. 11° 35' 0.5" | 12.392 |
| 1 | 12 54 55.50 | 1.7849 | 1 32 19.6 | 13.075 | 1 | 14 23 17.17 | 1.9259 | 11 47 16.9 | 12.956 |
| 2 | 12 56 42.63 | 1.7860 | 1 45 24.1 | 13.075 | 2 | 14 25 12.87 | 1.9306 | 11 59 31.2 | 12.919 |
| 3 | 12 58 29.82 | 1.7872 | 1 58 28.6 | 13.074 | 3 | 14 27 8.85 | 1.9354 | 12 11 43.2 | 12.181 |
| 4 | 13 0 17.09 | 1.7886 | 2 11 33.0 | 13.073 | 4 | 14 29 5.12 | 1.9403 | 12 23 52.9 | 12.142 |
| 5 | 13 2 4.45 | 1.7900 | 2 24 37.3 | 13.071 | 5 | 14 31 1.69 | 1.9454 | 12 36 0.2 | 12.101 |
| 6 | 13 3 51.89 | 1.7914 | 2 37 41.5 | 13.068 | 6 | 14 32 58.57 | 1.9505 | 12 48 5.0 | 12.059 |
| 7 | 13 5 39.42 | 1.7930 | 2 50 45.5 | 13.064 | 7 | 14 34 55.75 | 1.9556 | 13 0 7.3 | 12.017 |
| 8 | 13 7 27.05 | 1.7946 | 3 3 49.2 | 13.060 | 8 | 14 36 53.24 | 1.9608 | 13 12 7.1 | 11.975 |
| 9 | 13 9 14.77 | 1.7963 | 3 16 52.7 | 13.056 | 9 | 14 38 51.05 | 1.9661 | 13 24 4.3 | 11.931 |
| 10 | 13 11 2.60 | 1.7981 | 3 29 55.9 | 13.050 | 10 | 14 40 49.18 | 1.9715 | 13 35 58.8 | 11.886 |
| 11 | 13 12 50.54 | 1.7999 | 3 42 58.7 | 13.044 | 11 | 14 42 47.63 | 1.9768 | 13 47 50.6 | 11.840 |
| 12 | 13 14 38.59 | 1.8018 | 3 56 1.1 | 13.037 | 12 | 14 44 46.40 | 1.9823 | 13 59 39.6 | 11.792 |
| 13 | 13 16 26.76 | 1.8038 | 4 9 3.1 | 13.029 | 13 | 14 46 45.50 | 1.9879 | 14 11 25.7 | 11.744 |
| 14 | 13 18 15.05 | 1.8059 | 4 22 4.6 | 13.021 | 14 | 14 48 44.94 | 1.9936 | 14 23 8.9 | 11.695 |
| 15 | 13 20 3.47 | 1.8081 | 4 35 5.6 | 13.012 | 15 | 14 50 44.73 | 1.9993 | 14 34 49.1 | 11.644 |
| 16 | 13 21 52.02 | 1.8103 | 4 48 6.1 | 13.002 | 16 | 14 52 44.86 | 2.0050 | 14 46 26.2 | 11.592 |
| 17 | 13 23 40.70 | 1.8125 | 5 1 5.9 | 12.992 | 17 | 14 54 45.33 | 2.0108 | 14 58 0.1 | 11.539 |
| 18 | 13 25 29.52 | 1.8148 | 5 14 5.1 | 12.981 | 18 | 14 56 46.15 | 2.0167 | 15 9 30.9 | 11.486 |
| 19 | 13 27 18.48 | 1.8173 | 5 27 3.6 | 12.969 | 19 | 14 58 47.33 | 2.0227 | 15 20 58.4 | 11.431 |
| 20 | 13 29 7.60 | 1.8199 | 5 40 1.4 | 12.956 | 20 | 15 0 48.87 | 2.0287 | 15 32 22.6 | 11.374 |
| 21 | 13 30 56.87 | 1.8225 | 5 52 58.4 | 12.943 | 21 | 15 2 50.77 | 2.0347 | 15 43 43.3 | 11.317 |
| 22 | 13 32 46.30 | 1.8252 | 6 5 54.6 | 12.930 | 22 | 15 4 53.03 | 2.0408 | 15 55 0.6 | 11.259 |
| 23 | 13 34 35.89 | 1.8278 | S. 6 18 50.0 | 12.916 | 23 | 15 6 55.67 | 2.0471 | S. 16 6 14.4 | 11.199 |
| TUESDAY 14. | | | | | THURSDAY 16. | | | | |
| 0 | 13 36 25.64 | 1.8306 | S. 6 31 44.5 | 12.901 | 0 | 15 8 58.68 | 2.0534 | S. 16 17 24.5 | 11.138 |
| 1 | 13 38 15.56 | 1.8335 | 6 44 38.1 | 12.884 | 1 | 15 11 2.07 | 2.0597 | 16 28 30.9 | 11.076 |
| 2 | 13 40 5.66 | 1.8366 | 6 57 30.6 | 12.867 | 2 | 15 13 5.84 | 2.0660 | 16 39 33.6 | 11.013 |
| 3 | 13 41 55.95 | 1.8397 | 7 10 22.1 | 12.849 | 3 | 15 15 9.99 | 2.0724 | 16 50 32.5 | 10.949 |
| 4 | 13 43 46.43 | 1.8428 | 7 23 12.5 | 12.831 | 4 | 15 17 14.53 | 2.0789 | 17 1 27.5 | 10.883 |
| 5 | 13 45 37.09 | 1.8459 | 7 36 1.8 | 12.812 | 5 | 15 19 19.46 | 2.0855 | 17 12 18.5 | 10.815 |
| 6 | 13 47 27.94 | 1.8492 | 7 48 49.9 | 12.792 | 6 | 15 21 24.79 | 2.0921 | 17 23 5.3 | 10.746 |
| 7 | 13 49 18.99 | 1.8526 | 8 1 36.8 | 12.772 | 7 | 15 23 30.51 | 2.0988 | 17 33 48.0 | 10.677 |
| 8 | 13 51 10.25 | 1.8561 | 8 14 22.5 | 12.750 | 8 | 15 25 36.64 | 2.1055 | 17 44 26.6 | 10.607 |
| 9 | 13 53 1.72 | 1.8596 | 8 27 6.8 | 12.728 | 9 | 15 27 43.17 | 2.1122 | 17 55 0.9 | 10.535 |
| 10 | 13 54 53.40 | 1.8632 | 8 39 49.8 | 12.705 | 10 | 15 29 50.10 | 2.1189 | 18 5 30.8 | 10.462 |
| 11 | 13 56 45.30 | 1.8668 | 8 52 31.4 | 12.681 | 11 | 15 31 57.44 | 2.1258 | 18 15 56.3 | 10.388 |
| 12 | 13 58 37.41 | 1.8704 | 9 5 11.5 | 12.656 | 12 | 15 34 5.20 | 2.1327 | 18 26 17.3 | 10.312 |
| 13 | 14 0 29.75 | 1.8743 | 9 17 50.1 | 12.630 | 13 | 15 36 13.37 | 2.1397 | 18 36 33.7 | 10.234 |
| 14 | 14 2 22.33 | 1.8782 | 9 30 27.1 | 12.604 | 14 | 15 38 21.96 | 2.1467 | 18 46 45.4 | 10.155 |
| 15 | 14 4 15.14 | 1.8822 | 9 43 2.5 | 12.577 | 15 | 15 40 30.97 | 2.1537 | 18 56 52.3 | 10.075 |
| 16 | 14 6 8.19 | 1.8862 | 9 55 36.3 | 12.549 | 16 | 15 42 40.41 | 2.1608 | 19 6 54.4 | 9.993 |
| 17 | 14 8 1.49 | 1.8903 | 10 8 8.4 | 12.520 | 17 | 15 44 50.27 | 2.1678 | 19 16 51.5 | 9.910 |
| 18 | 14 9 55.03 | 1.8944 | 10 20 38.7 | 12.490 | 18 | 15 47 0.55 | 2.1749 | 19 26 43.6 | 9.826 |
| 19 | 14 11 48.82 | 1.8987 | 10 33 7.2 | 12.459 | 19 | 15 49 11.26 | 2.1821 | 19 36 30.6 | 9.741 |
| 20 | 14 13 42.87 | 1.9031 | 10 45 33.8 | 12.427 | 20 | 15 51 22.41 | 2.1894 | 19 46 12.5 | 9.654 |
| 21 | 14 15 37.19 | 1.9075 | 10 57 58.5 | 12.395 | 21 | 15 53 33.99 | 2.1967 | 19 55 49.1 | 9.565 |
| 22 | 14 17 31.77 | 1.9120 | 11 10 21.2 | 12.362 | 22 | 15 55 46.01 | 2.2039 | 20 5 20.3 | 9.475 |
| 23 | 14 19 26.63 | 1.9166 | 11 22 41.9 | 12.327 | 23 | 15 57 58.46 | 2.2112 | 20 14 46.1 | 9.384 |
| 24 | 14 21 21.76 | 1.9212 | S. 11 35 0.5 | 12.292 | 24 | 16 0 11.35 | 2.2185 | S. 20 24 6.4 | 9.292 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|-----------------|---------------------|------------|------------------|---------------------|-----------------|---------------------|
| FRIDAY 17. | | | | | SUNDAY 19. | | | | |
| 0 | h m s | " | S. 20° 24' 6.4" | 9.292 | 0 | h m s | " | S. 25° 35' 4.2" | 3.103 |
| 1 | 16 0 11.35 | 2.9185 | 20 33 21.1 | 9.198 | 1 | 17 55 0.80 | 2.5502 | 25 38 5.5 | 2.940 |
| 2 | 16 2 24.68 | 2.9358 | 20 42 30.1 | 9.102 | 2 | 17 57 33.97 | 2.5555 | 25 40 57.0 | 2.777 |
| 3 | 16 4 38.45 | 2.9332 | 20 51 33.3 | 9.004 | 3 | 18 0 7.46 | 2.5607 | 25 43 38.7 | 2.613 |
| 4 | 16 6 52.67 | 2.9406 | 21 0 30.6 | 8.906 | 4 | 18 2 41.26 | 2.5657 | 25 46 10.5 | 2.446 |
| 5 | 16 9 7.33 | 2.9480 | 21 9 22.0 | 8.807 | 5 | 18 5 15.35 | 2.5707 | 25 48 32.2 | 2.278 |
| 6 | 16 11 22.43 | 2.9554 | 21 18 7.4 | 8.705 | 6 | 18 7 49.74 | 2.5755 | 25 50 43.8 | 2.109 |
| 7 | 16 13 37.98 | 2.9629 | 21 26 46.6 | 8.602 | 7 | 18 10 24.41 | 2.5801 | 25 52 45.3 | 1.941 |
| 8 | 16 15 53.98 | 2.9703 | 21 35 19.6 | 8.498 | 8 | 18 12 59.35 | 2.5847 | 25 54 36.7 | 1.771 |
| 9 | 16 18 10.42 | 2.9777 | 21 43 46.3 | 8.392 | 9 | 18 15 34.57 | 2.5892 | 25 56 17.8 | 1.599 |
| 10 | 16 20 27.31 | 2.9852 | 21 52 6.6 | 8.284 | 10 | 18 18 10.05 | 2.5934 | 25 57 48.6 | 1.427 |
| 11 | 16 22 44.65 | 2.9927 | 22 0 20.4 | 8.175 | 11 | 18 20 45.78 | 2.5976 | 25 59 9.0 | 1.254 |
| 12 | 16 25 2.43 | 2.3001 | 22 8 27.6 | 8.064 | 12 | 18 23 21.76 | 2.6016 | 26 0 19.1 | 1.081 |
| 13 | 16 27 20.66 | 2.3076 | 22 16 28.1 | 7.952 | 13 | 18 25 57.97 | 2.6054 | 26 1 18.7 | 0.908 |
| 14 | 16 29 39.34 | 2.3151 | 22 24 21.9 | 7.839 | 14 | 18 28 34.41 | 2.6092 | 26 2 7.8 | 0.731 |
| 15 | 16 31 58.47 | 2.3225 | 22 32 8.8 | 7.724 | 15 | 18 31 11.07 | 2.6127 | 26 2 46.4 | 0.555 |
| 16 | 16 34 18.04 | 2.3299 | 22 39 48.8 | 7.607 | 16 | 18 33 47.93 | 2.6160 | 26 3 14.4 | 0.378 |
| 17 | 16 36 38.06 | 2.3373 | 22 47 21.7 | 7.489 | 17 | 18 36 24.99 | 2.6193 | 26 3 31.7 | 0.200 |
| 18 | 16 38 58.52 | 2.3448 | 22 54 47.5 | 7.370 | 18 | 18 39 2.25 | 2.6225 | 26 3 38.4 | - 0.022 |
| 19 | 16 41 19.43 | 2.3522 | 23 2 6.1 | 7.249 | 19 | 18 41 39.69 | 2.6254 | 26 3 34.4 | + 0.157 |
| 20 | 16 43 40.78 | 2.3593 | 23 9 17.4 | 7.126 | 20 | 18 44 17.30 | 2.6282 | 26 3 19.6 | 0.336 |
| 21 | 16 46 2.57 | 2.3668 | 23 16 21.2 | 7.001 | 21 | 18 46 55.07 | 2.6308 | 26 2 54.1 | 0.515 |
| 22 | 16 48 24.81 | 2.3743 | 23 23 17.5 | 6.876 | 22 | 18 49 33.00 | 2.6333 | 26 2 17.8 | 0.695 |
| 23 | 16 50 47.49 | 2.3816 | S. 23 30 6.3 | 6.750 | 23 | 18 52 11.07 | 2.6357 | S. 26 1 30.7 | 0.678 |
| 24 | 16 53 10.60 | 2.3888 | | | | 18 54 49.28 | 2.6379 | | |
| SATURDAY 18. | | | | | MONDAY 20. | | | | |
| 0 | 16 55 34.14 | 2.3960 | S. 23 36 47.5 | 6.622 | 0 | 18 57 27.62 | 2.6399 | S. 26 0 32.7 | 1.057 |
| 1 | 16 57 58.12 | 2.4032 | 23 43 20.9 | 6.491 | 1 | 19 0 6.07 | 2.6417 | 25 59 23.8 | 1.230 |
| 2 | 17 0 22.53 | 2.4103 | 23 49 46.4 | 6.358 | 2 | 19 2 44.63 | 2.6434 | 25 58 4.0 | 1.400 |
| 3 | 17 2 47.36 | 2.4174 | 23 56 3.9 | 6.225 | 3 | 19 5 23.28 | 2.6449 | 25 56 33.4 | 1.601 |
| 4 | 17 5 12.62 | 2.4245 | 24 2 13.4 | 6.091 | 4 | 19 8 2.02 | 2.6463 | 25 54 51.9 | 1.783 |
| 5 | 17 7 38.30 | 2.4314 | 24 8 14.8 | 5.955 | 5 | 19 10 40.84 | 2.6475 | 25 52 59.4 | 1.966 |
| 6 | 17 10 4.39 | 2.4383 | 24 14 8.0 | 5.817 | 6 | 19 13 19.72 | 2.6485 | 25 50 55.9 | 2.149 |
| 7 | 17 12 30.90 | 2.4452 | 24 19 52.9 | 5.678 | 7 | 19 15 58.66 | 2.6494 | 25 48 41.5 | 2.339 |
| 8 | 17 14 57.82 | 2.4521 | 24 25 29.4 | 5.538 | 8 | 19 18 37.65 | 2.6501 | 25 46 16.1 | 2.514 |
| 9 | 17 17 25.15 | 2.4588 | 24 30 57.4 | 5.396 | 9 | 19 21 16.67 | 2.6506 | 25 43 39.8 | 2.697 |
| 10 | 17 19 52.88 | 2.4655 | 24 36 16.9 | 5.252 | 10 | 19 23 55.72 | 2.6510 | 25 40 52.5 | 2.880 |
| 11 | 17 22 21.01 | 2.4722 | 24 41 27.7 | 5.107 | 11 | 19 26 34.79 | 2.6512 | 25 37 54.2 | 3.069 |
| 12 | 17 24 49.54 | 2.4787 | 24 46 29.7 | 4.960 | 12 | 19 29 13.87 | 2.6513 | 25 34 45.0 | 3.245 |
| 13 | 17 27 18.46 | 2.4852 | 24 51 22.9 | 4.813 | 13 | 19 31 52.95 | 2.6512 | 25 31 24.8 | 3.427 |
| 14 | 17 29 47.76 | 2.4915 | 24 56 7.3 | 4.665 | 14 | 19 34 32.01 | 2.6508 | 25 27 53.7 | 3.609 |
| 15 | 17 32 17.44 | 2.4978 | 25 0 42.7 | 4.514 | 15 | 19 37 11.05 | 2.6504 | 25 24 11.7 | 3.791 |
| 16 | 17 34 47.50 | 2.5041 | 25 5 9.0 | 4.362 | 16 | 19 39 50.06 | 2.6496 | 25 20 18.8 | 3.972 |
| 17 | 17 37 17.93 | 2.5102 | 25 9 26.2 | 4.210 | 17 | 19 42 29.03 | 2.6492 | 25 16 15.0 | 4.154 |
| 18 | 17 39 48.72 | 2.5162 | 25 13 34.2 | 4.056 | 18 | 19 45 7.96 | 2.6483 | 25 12 0.3 | 4.335 |
| 19 | 17 42 19.87 | 2.5222 | 25 17 32.9 | 3.900 | 19 | 19 47 46.82 | 2.6471 | 25 7 34.8 | 4.515 |
| 20 | 17 44 51.38 | 2.5280 | 25 21 22.2 | 3.743 | 20 | 19 50 25.61 | 2.6459 | 25 2 58.5 | 4.695 |
| 21 | 17 47 23.23 | 2.5337 | 25 25 2.1 | 3.585 | 21 | 19 53 4.33 | 2.6446 | 24 58 11.4 | 4.875 |
| 22 | 17 49 55.42 | 2.5393 | 25 28 32.4 | 3.425 | 22 | 19 55 42.96 | 2.6431 | 24 53 13.5 | 5.054 |
| 23 | 17 52 27.95 | 2.5448 | 25 31 53.1 | 3.265 | 23 | 19 58 21.50 | 2.6414 | 24 48 4.9 | 5.233 |
| 24 | 17 55 0.80 | 2.5502 | S. 25 35 4.2 | 3.103 | 24 | 20 0 59.93 | 2.6396 | S. 24 42 45.6 | 5.411 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|---|---------------------|------------------|---------------------|--------------|---|---------------------|------------------|---------------------|
| TUESDAY 21. | | | | | THURSDAY 23. | | | | |
| 0 | ^h 20 ^m 0 ^s 59.93 | 2.6396 | S. 24° 42' 45.6" | 5.411 | 0 | ^h 22 ^m 3 ^s 26.89 | 2.4339 | S. 17° 18' 28.4" | 12.555 |
| 1 | 20 3 38.25 | 2.6377 | 24 37 15.6 | 5.588 | 1 | 22 5 52.72 | 2.4277 | 17 5 51.8 | 12.664 |
| 2 | 20 6 16.45 | 2.6355 | 24 31 35.0 | 5.764 | 2 | 22 8 18.22 | 2.4229 | 16 53 8.7 | 12.772 |
| 3 | 20 8 54.51 | 2.6339 | 24 25 43.9 | 5.939 | 3 | 22 10 43.38 | 2.4166 | 16 40 19.2 | 12.878 |
| 4 | 20 11 32.43 | 2.6308 | 24 19 42.3 | 6.114 | 4 | 22 13 8.21 | 2.4112 | 16 27 23.4 | 12.982 |
| 5 | 20 14 10.21 | 2.6284 | 24 13 30.2 | 6.288 | 5 | 22 15 32.72 | 2.4057 | 16 14 21.4 | 13.083 |
| 6 | 20 16 47.84 | 2.6257 | 24 7 7.7 | 6.469 | 6 | 22 17 56.90 | 2.4002 | 16 1 13.4 | 13.183 |
| 7 | 20 19 25.30 | 2.6229 | 24 0 34.8 | 6.634 | 7 | 22 20 20.75 | 2.3947 | 15 47 59.4 | 13.282 |
| 8 | 20 22 2.59 | 2.6201 | 23 53 51.6 | 6.806 | 8 | 22 22 44.27 | 2.3892 | 15 34 39.6 | 13.378 |
| 9 | 20 24 39.71 | 2.6171 | 23 46 58.1 | 6.977 | 9 | 22 25 7.46 | 2.3838 | 15 21 14.0 | 13.473 |
| 10 | 20 27 16.64 | 2.6138 | 23 39 54.4 | 7.147 | 10 | 22 27 30.33 | 2.3785 | 15 7 42.8 | 13.566 |
| 11 | 20 29 53.37 | 2.6105 | 23 32 40.5 | 7.315 | 11 | 22 29 52.88 | 2.3731 | 14 54 6.1 | 13.657 |
| 12 | 20 32 29.90 | 2.6072 | 23 25 16.6 | 7.489 | 12 | 22 32 15.10 | 2.3677 | 14 40 24.0 | 13.746 |
| 13 | 20 35 6.23 | 2.6037 | 23 17 42.7 | 7.658 | 13 | 22 34 37.00 | 2.3624 | 14 26 36.6 | 13.832 |
| 14 | 20 37 42.34 | 2.6000 | 23 9 58.8 | 7.813 | 14 | 22 36 58.58 | 2.3571 | 14 12 44.1 | 13.917 |
| 15 | 20 40 18.23 | 2.5963 | 23 2 5.1 | 7.977 | 15 | 22 39 19.85 | 2.3518 | 13 58 46.5 | 14.001 |
| 16 | 20 42 53.90 | 2.5925 | 22 54 1.6 | 8.140 | 16 | 22 41 40.80 | 2.3466 | 13 44 44.0 | 14.082 |
| 17 | 20 45 29.33 | 2.5888 | 22 45 48.3 | 8.303 | 17 | 22 44 1.44 | 2.3413 | 13 30 36.7 | 14.162 |
| 18 | 20 48 4.52 | 2.5844 | 22 37 25.4 | 8.469 | 18 | 22 46 21.76 | 2.3361 | 13 16 24.6 | 14.240 |
| 19 | 20 50 39.46 | 2.5803 | 22 28 52.9 | 8.621 | 19 | 22 48 41.77 | 2.3310 | 13 2 7.9 | 14.315 |
| 20 | 20 53 14.16 | 2.5769 | 22 20 10.9 | 8.778 | 20 | 22 51 1.48 | 2.3260 | 12 47 46.8 | 14.388 |
| 21 | 20 55 48.60 | 2.5718 | 22 11 19.5 | 8.934 | 21 | 22 53 20.89 | 2.3210 | 12 33 21.3 | 14.461 |
| 22 | 20 58 22.78 | 2.5674 | 22 2 18.8 | 9.089 | 22 | 22 55 40.00 | 2.3159 | 12 18 51.5 | 14.531 |
| 23 | 21 0 56.69 | 2.5629 | S. 21° 53' 8.8" | 9.249 | 23 | 22 57 58.80 | 2.3109 | S. 12° 4' 17.6" | 14.596 |
| WEDNESDAY 22. | | | | | FRIDAY 24. | | | | |
| 0 | 21 3 30.33 | 2.5583 | S. 21° 43' 49.7" | 9.394 | 0 | 23 0 17.31 | 2.3061 | S. 11° 49' 39.7" | 14.664 |
| 1 | 21 6 3.69 | 2.5537 | 21 34 21.5 | 9.545 | 1 | 23 2 35.53 | 2.3012 | 11 34 57.9 | 14.796 |
| 2 | 21 8 36.77 | 2.5490 | 21 24 44.3 | 9.694 | 2 | 23 4 53.46 | 2.2964 | 11 20 12.3 | 14.799 |
| 3 | 21 11 9.57 | 2.5442 | 21 14 58.2 | 9.849 | 3 | 23 7 11.10 | 2.2917 | 11 5 22.9 | 14.553 |
| 4 | 21 13 42.08 | 2.5393 | 21 5 3.3 | 9.988 | 4 | 23 9 28.46 | 2.2870 | 10 50 29.9 | 14.912 |
| 5 | 21 16 14.29 | 2.5344 | 20 54 59.6 | 10.139 | 5 | 23 11 45.54 | 2.2824 | 10 35 33.5 | 14.968 |
| 6 | 21 18 46.21 | 2.5295 | 20 44 47.4 | 10.274 | 6 | 23 14 2.35 | 2.2778 | 10 20 33.7 | 15.094 |
| 7 | 21 21 17.83 | 2.5244 | 20 34 26.7 | 10.416 | 7 | 23 16 18.88 | 2.2732 | 10 5 30.6 | 15.077 |
| 8 | 21 23 49.14 | 2.5193 | 20 23 57.5 | 10.556 | 8 | 23 18 35.14 | 2.2688 | 9 50 24.4 | 15.196 |
| 9 | 21 26 20.15 | 2.5142 | 20 13 20.0 | 10.693 | 9 | 23 20 51.14 | 2.2645 | 9 35 15.2 | 15.178 |
| 10 | 21 28 50.85 | 2.5090 | 20 2 34.3 | 10.829 | 10 | 23 23 6.88 | 2.2601 | 9 20 3.0 | 15.296 |
| 11 | 21 31 21.23 | 2.5037 | 19 51 40.5 | 10.964 | 11 | 23 25 22.36 | 2.2558 | 9 4 48.0 | 15.372 |
| 12 | 21 33 51.30 | 2.4985 | 19 40 38.6 | 11.097 | 12 | 23 27 37.58 | 2.2516 | 8 49 30.4 | 15.315 |
| 13 | 21 36 21.05 | 2.4932 | 19 29 28.8 | 11.228 | 13 | 23 29 52.55 | 2.2475 | 8 34 10.2 | 15.258 |
| 14 | 21 38 50.48 | 2.4878 | 19 18 11.2 | 11.357 | 14 | 23 32 7.28 | 2.2435 | 8 18 47.4 | 15.400 |
| 15 | 21 41 19.59 | 2.4825 | 19 6 45.9 | 11.485 | 15 | 23 34 21.77 | 2.2395 | 8 3 22.2 | 15.439 |
| 16 | 21 43 48.38 | 2.4771 | 18 55 13.0 | 11.611 | 16 | 23 36 36.02 | 2.2355 | 7 47 54.7 | 15.477 |
| 17 | 21 46 16.84 | 2.4717 | 18 43 32.6 | 11.736 | 17 | 23 38 50.03 | 2.2316 | 7 32 25.0 | 15.512 |
| 18 | 21 48 44.98 | 2.4662 | 18 31 44.7 | 11.858 | 18 | 23 41 3.81 | 2.2277 | 7 16 53.3 | 15.545 |
| 19 | 21 51 12.79 | 2.4607 | 18 19 49.6 | 11.978 | 19 | 23 43 17.36 | 2.2240 | 7 1 19.6 | 15.578 |
| 20 | 21 53 40.27 | 2.4552 | 18 7 47.3 | 12.097 | 20 | 23 45 30.69 | 2.2204 | 6 45 44.0 | 15.608 |
| 21 | 21 56 7.42 | 2.4497 | 17 55 37.9 | 12.214 | 21 | 23 47 43.81 | 2.2169 | 6 30 6.7 | 15.636 |
| 22 | 21 58 34.24 | 2.4442 | 17 43 21.6 | 12.329 | 22 | 23 49 56.72 | 2.2134 | 6 14 27.7 | 15.662 |
| 23 | 22 1 0.73 | 2.4387 | 17 30 58.4 | 12.443 | 23 | 23 52 9.42 | 2.2099 | 5 58 47.2 | 15.687 |
| 24 | 22 3 26.89 | 2.4332 | S. 17° 18' 28.4" | 12.555 | 24 | 23 54 21.91 | 2.2065 | S. 5° 43' 5.2" | 15.711 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|--|---------------------|----------------|---------------------|-------------|---|---------------------|----------------|---------------------|
| SATURDAY 25. | | | | | MONDAY 27. | | | | |
| 0 | ^h 23 ^m 54 ^s 21.91 | 2.9065 | S. 5° 43' 5.2" | 15.711 | 0 | ^h 1 ^m 37 ^s 53.16 | 2.1368 | N. 6° 48' 0.6" | 15.021 |
| 1 | 23 56 34.20 | 2.9033 | 5 27 21.9 | 15.733 | 1 | 1 40 1.38 | 2.1372 | 7 3 0.4 | 14.972 |
| 2 | 23 58 46.30 | 2.9001 | 5 11 37.3 | 15.753 | 2 | 1 42 9.63 | 2.1378 | 7 17 57.3 | 14.923 |
| 3 | 0 0 58.21 | 2.1969 | 4 55 51.5 | 15.772 | 3 | 1 44 17.92 | 2.1385 | 7 32 51.2 | 14.872 |
| 4 | 0 3 9.93 | 2.1938 | 4 40 4.7 | 15.788 | 4 | 1 46 26.25 | 2.1391 | 7 47 41.9 | 14.819 |
| 5 | 0 5 21.47 | 2.1908 | 4 24 17.0 | 15.803 | 5 | 1 48 34.61 | 2.1397 | 8 2 29.4 | 14.765 |
| 6 | 0 7 32.83 | 2.1879 | 4 8 28.4 | 15.816 | 6 | 1 50 43.01 | 2.1404 | 8 17 13.7 | 14.710 |
| 7 | 0 9 44.02 | 2.1851 | 3 52 39.1 | 15.827 | 7 | 1 52 51.46 | 2.1413 | 8 31 54.6 | 14.654 |
| 8 | 0 11 55.05 | 2.1824 | 3 36 49.1 | 15.838 | 8 | 1 54 59.97 | 2.1422 | 8 46 32.1 | 14.597 |
| 9 | 0 14 5.91 | 2.1797 | 3 20 58.5 | 15.847 | 9 | 1 57 8.53 | 2.1432 | 9 1 6.2 | 14.538 |
| 10 | 0 16 16.61 | 2.1771 | 3 5 7.5 | 15.853 | 10 | 1 59 17.15 | 2.1442 | 9 15 36.7 | 14.478 |
| 11 | 0 18 27.16 | 2.1746 | 2 49 16.1 | 15.859 | 11 | 2 1 25.84 | 2.1453 | 9 30 3.6 | 14.417 |
| 12 | 0 20 37.56 | 2.1721 | 2 33 24.4 | 15.863 | 12 | 2 3 31.59 | 2.1465 | 9 44 26.8 | 14.355 |
| 13 | 0 22 47.81 | 2.1698 | 2 17 32.5 | 15.865 | 13 | 2 5 43.42 | 2.1477 | 9 58 46.2 | 14.292 |
| 14 | 0 24 57.93 | 2.1676 | 2 1 40.6 | 15.865 | 14 | 2 7 52.32 | 2.1490 | 10 13 1.8 | 14.227 |
| 15 | 0 27 7.92 | 2.1654 | 1 45 48.7 | 15.864 | 15 | 2 10 1.30 | 2.1503 | 10 27 13.5 | 14.161 |
| 16 | 0 29 17.78 | 2.1632 | 1 29 56.9 | 15.862 | 16 | 2 12 10.36 | 2.1517 | 10 41 21.1 | 14.094 |
| 17 | 0 31 27.51 | 2.1612 | 1 14 5.2 | 15.859 | 17 | 2 14 19.51 | 2.1532 | 10 55 24.7 | 14.026 |
| 18 | 0 33 37.12 | 2.1592 | 0 58 13.8 | 15.853 | 18 | 2 16 28.75 | 2.1547 | 11 9 24.2 | 13.957 |
| 19 | 0 35 46.61 | 2.1573 | 0 42 22.8 | 15.846 | 19 | 2 18 38.08 | 2.1563 | 11 23 19.5 | 13.886 |
| 20 | 0 37 56.00 | 2.1556 | 0 26 32.3 | 15.838 | 20 | 2 20 47.51 | 2.1580 | 11 37 10.5 | 13.813 |
| 21 | 0 40 5.28 | 2.1539 | S. 0 10 42.3 | 15.828 | 21 | 2 22 57.04 | 2.1597 | 11 50 57.1 | 13.740 |
| 22 | 0 42 14.46 | 2.1522 | N. 0 5 7.0 | 15.816 | 22 | 2 25 6.67 | 2.1614 | 12 4 39.3 | 13.667 |
| 23 | 0 44 23.54 | 2.1506 | 0 20 55.6 | 15.802 | 23 | 2 27 16.41 | 2.1631 | N. 12 18 17.1 | 13.593 |
| SUNDAY 26. | | | | | TUESDAY 28. | | | | |
| 0 | 0 46 32.53 | 2.1491 | N. 0 36 43.3 | 15.787 | 0 | 2 29 26.25 | 2.1650 | N. 12 31 50.4 | 13.517 |
| 1 | 0 48 41.44 | 2.1477 | 0 52 30.1 | 15.772 | 1 | 2 31 36.21 | 2.1670 | 12 45 19.1 | 13.438 |
| 2 | 0 50 50.26 | 2.1463 | 1 8 15.9 | 15.755 | 2 | 2 33 46.29 | 2.1689 | 12 58 43.0 | 13.359 |
| 3 | 0 52 59.00 | 2.1451 | 1 24 0.7 | 15.737 | 3 | 2 35 56.48 | 2.1709 | 13 12 2.2 | 13.280 |
| 4 | 0 55 7.67 | 2.1440 | 1 39 44.3 | 15.716 | 4 | 2 38 6.79 | 2.1730 | 13 25 16.6 | 13.199 |
| 5 | 0 57 16.28 | 2.1429 | 1 55 26.6 | 15.694 | 5 | 2 40 17.23 | 2.1751 | 13 38 26.1 | 13.117 |
| 6 | 0 59 24.82 | 2.1418 | 2 11 7.6 | 15.673 | 6 | 2 42 27.80 | 2.1772 | 13 51 30.6 | 13.033 |
| 7 | 1 1 33.30 | 2.1409 | 2 26 47.2 | 15.647 | 7 | 2 44 38.50 | 2.1794 | 14 4 30.1 | 12.949 |
| 8 | 1 3 41.73 | 2.1401 | 2 42 25.2 | 15.620 | 8 | 2 46 49.33 | 2.1816 | 14 17 24.5 | 12.864 |
| 9 | 1 5 50.12 | 2.1394 | 2 58 1.6 | 15.592 | 9 | 2 49 0.29 | 2.1838 | 14 30 13.8 | 12.778 |
| 10 | 1 7 58.46 | 2.1387 | 3 13 36.3 | 15.564 | 10 | 2 51 11.39 | 2.1862 | 14 42 57.9 | 12.691 |
| 11 | 1 10 6.76 | 2.1381 | 3 29 9.3 | 15.535 | 11 | 2 53 22.63 | 2.1886 | 14 55 36.7 | 12.602 |
| 12 | 1 12 15.03 | 2.1376 | 3 44 40.5 | 15.503 | 12 | 2 55 34.02 | 2.1910 | 15 8 10.1 | 12.512 |
| 13 | 1 14 23.27 | 2.1371 | 4 0 9.7 | 15.470 | 13 | 2 57 45.55 | 2.1934 | 15 20 38.1 | 12.422 |
| 14 | 1 16 31.48 | 2.1367 | 4 15 36.9 | 15.436 | 14 | 2 59 57.22 | 2.1958 | 15 33 0.7 | 12.330 |
| 15 | 1 18 39.67 | 2.1363 | 4 31 2.0 | 15.400 | 15 | 3 2 9.04 | 2.1983 | 15 45 17.7 | 12.237 |
| 16 | 1 20 47.84 | 2.1361 | 4 46 24.9 | 15.363 | 16 | 3 4 21.01 | 2.2008 | 15 57 29.1 | 12.143 |
| 17 | 1 22 56.00 | 2.1359 | 5 1 45.6 | 15.325 | 17 | 3 6 33.14 | 2.2034 | 16 9 34.9 | 12.048 |
| 18 | 1 25 4.15 | 2.1358 | 5 17 3.9 | 15.285 | 18 | 3 8 45.42 | 2.2060 | 16 21 34.9 | 11.952 |
| 19 | 1 27 12.30 | 2.1358 | 5 32 19.8 | 15.244 | 19 | 3 10 57.86 | 2.2086 | 16 33 29.1 | 11.855 |
| 20 | 1 29 20.45 | 2.1359 | 5 47 33.2 | 15.203 | 20 | 3 13 10.45 | 2.2112 | 16 45 17.5 | 11.757 |
| 21 | 1 31 28.61 | 2.1361 | 6 2 44.1 | 15.160 | 21 | 3 15 23.20 | 2.2138 | 16 57 0.0 | 11.658 |
| 22 | 1 33 36.78 | 2.1363 | 6 17 52.4 | 15.115 | 22 | 3 17 36.11 | 2.2165 | 17 8 36.5 | 11.558 |
| 23 | 1 35 44.96 | 2.1365 | 6 32 57.9 | 15.068 | 23 | 3 19 49.18 | 2.2192 | 17 20 7.0 | 11.457 |
| 24 | 1 37 53.16 | 2.1368 | N. 6 48 0.6 | 15.021 | 24 | 3 22 2.42 | 2.2220 | N. 17 31 31.3 | 11.354 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|------------------|---------------------|----------------|---------------------|---|------------------|---------------------|----------------|---------------------|
| WEDNESDAY 29. | | | | | FRIDAY 31. | | | | |
| 0 | 3 22 2.42 | 2.2220 | N.17° 31' 31.3 | 11.354 | 0 | 5 11 49.02 | 2.3431 | N.24° 21' 48.8 | 5.442 |
| 1 | 3 24 15.82 | 2.2247 | 17 42 49.5 | 11.351 | 1 | 5 14 9.65 | 2.3447 | 24 27 11.2 | 5.303 |
| 2 | 3 26 29.39 | 2.2275 | 17 54 1.5 | 11.147 | 2 | 5 16 30.38 | 2.3463 | 24 32 25.2 | 5.163 |
| 3 | 3 28 43.12 | 2.2303 | 18 5 7.2 | 11.042 | 3 | 5 18 51.20 | 2.3478 | 24 37 30.8 | 5.023 |
| 4 | 3 30 57.02 | 2.2331 | 18 16 6.6 | 10.937 | 4 | 5 21 12.11 | 2.3491 | 24 42 28.0 | 4.882 |
| 5 | 3 33 11.09 | 2.2358 | 18 26 59.6 | 10.829 | 5 | 5 23 33.09 | 2.3503 | 24 47 16.7 | 4.742 |
| 6 | 3 35 25.32 | 2.2386 | 18 37 46.1 | 10.721 | 6 | 5 25 54.15 | 2.3516 | 24 51 57.0 | 4.601 |
| 7 | 3 37 39.72 | 2.2415 | 18 48 26.1 | 10.612 | 7 | 5 28 15.28 | 2.3528 | 24 56 28.8 | 4.458 |
| 8 | 3 39 54.30 | 2.2444 | 18 58 59.6 | 10.503 | 8 | 5 30 36.48 | 2.3539 | 25 0 52.0 | 4.316 |
| 9 | 3 42 9.05 | 2.2473 | 19 9 26.5 | 10.392 | 9 | 5 32 57.75 | 2.3549 | 25 5 6.7 | 4.173 |
| 10 | 3 44 23.97 | 2.2501 | 19 19 46.7 | 10.280 | 10 | 5 35 19.07 | 2.3558 | 25 9 12.8 | 4.030 |
| 11 | 3 46 39.06 | 2.2528 | 19 30 0.1 | 10.167 | 11 | 5 37 40.44 | 2.3567 | 25 13 10.3 | 3.888 |
| 12 | 3 48 54.31 | 2.2557 | 19 40 6.7 | 10.053 | 12 | 5 40 1.87 | 2.3575 | 25 16 59.3 | 3.745 |
| 13 | 3 51 9.74 | 2.2586 | 19 50 6.5 | 9.939 | 13 | 5 42 23.34 | 2.3582 | 25 20 39.7 | 3.601 |
| 14 | 3 53 25.34 | 2.2614 | 19 59 59.4 | 9.823 | 14 | 5 44 44.85 | 2.3588 | 25 24 11.4 | 3.457 |
| 15 | 3 55 41.11 | 2.2642 | 20 9 45.3 | 9.707 | 15 | 5 47 6.39 | 2.3593 | 25 27 34.5 | 3.313 |
| 16 | 3 57 57.05 | 2.2670 | 20 19 24.2 | 9.590 | 16 | 5 49 27.96 | 2.3598 | 25 30 49.0 | 3.169 |
| 17 | 4 0 13.15 | 2.2698 | 20 28 56.1 | 9.472 | 17 | 5 51 49.56 | 2.3602 | 25 33 54.8 | 3.024 |
| 18 | 4 2 29.43 | 2.2727 | 20 38 20.9 | 9.354 | 18 | 5 54 11.18 | 2.3604 | 25 36 51.9 | 2.879 |
| 19 | 4 4 45.88 | 2.2755 | 20 47 38.6 | 9.234 | 19 | 5 56 32.81 | 2.3606 | 25 39 40.3 | 2.735 |
| 20 | 4 7 2.49 | 2.2783 | 20 56 49.0 | 9.113 | 20 | 5 58 54.45 | 2.3607 | 25 42 20.1 | 2.591 |
| 21 | 4 9 19.27 | 2.2811 | 21 5 52.1 | 8.991 | 21 | 6 1 16.10 | 2.3608 | 25 44 51.2 | 2.446 |
| 22 | 4 11 36.22 | 2.2838 | 21 14 47.9 | 8.869 | 22 | 6 3 37.75 | 2.3607 | 25 47 13.6 | 2.301 |
| 23 | 4 13 53.33 | 2.2865 | N.21 23 36.4 | 8.747 | 23 | 6 5 59.39 | 2.3606 | N.25 49 27.3 | 2.157 |
| THURSDAY 30. | | | | | SATURDAY, AUGUST 1. | | | | |
| 0 | 4 16 10.60 | 2.2893 | N.21 32 17.5 | 8.623 | 0 | 6 8 21.02 | 2.3603 | N.25 51 32.4 | 2.012 |
| 1 | 4 18 28.04 | 2.2920 | 21 40 51.2 | 8.499 | PHASES OF THE MOON. | | | | |
| 2 | 4 20 45.64 | 2.2946 | 21 49 17.4 | 8.373 | | | | | |
| 3 | 4 23 3.30 | 2.2972 | 21 57 36.0 | 8.247 | | | | | |
| 4 | 4 25 21.30 | 2.2998 | 22 5 47.0 | 8.119 | | | | | |
| 5 | 4 27 39.37 | 2.3024 | 22 13 50.3 | 7.991 | ● New Moon . . . July 5 15 58.5 ☾ First Quarter . . . 13 17 28.9 ○ Full Moon . . . 21 1 54.1 ☾ Last Quarter . . . 27 16 32.6 | | | | |
| 6 | 4 29 57.59 | 2.3049 | 22 21 45.9 | 7.862 | | | | | |
| 7 | 4 32 15.96 | 2.3074 | 22 29 33.8 | 7.734 | | | | | |
| 8 | 4 34 34.48 | 2.3099 | 22 37 14.0 | 7.605 | | | | | |
| 9 | 4 36 53.15 | 2.3123 | 22 44 46.4 | 7.475 | ☾ Apogee . . . July 11 6.4 ☾ Perigee . . . 23 5.0 | | | | |
| 10 | 4 39 11.96 | 2.3147 | 22 52 11.0 | 7.343 | | | | | |
| 11 | 4 41 30.92 | 2.3171 | 22 59 27.6 | 7.211 | | | | | |
| 12 | 4 43 50.02 | 2.3194 | 23 6 36.3 | 7.078 | | | | | |
| 13 | 4 46 9.25 | 2.3217 | 23 13 37.0 | 6.945 | | | | | |
| 14 | 4 48 28.62 | 2.3239 | 23 20 29.7 | 6.812 | | | | | |
| 15 | 4 50 48.12 | 2.3261 | 23 27 14.4 | 6.677 | | | | | |
| 16 | 4 53 7.75 | 2.3282 | 23 33 51.0 | 6.542 | | | | | |
| 17 | 4 55 27.50 | 2.3303 | 23 40 19.5 | 6.407 | | | | | |
| 18 | 4 57 47.38 | 2.3322 | 23 46 39.8 | 6.271 | | | | | |
| 19 | 5 0 7.38 | 2.3342 | 23 52 52.0 | 6.134 | | | | | |
| 20 | 5 2 27.49 | 2.3361 | 23 58 55.9 | 5.997 | | | | | |
| 21 | 5 4 47.71 | 2.3379 | 24 4 51.6 | 5.859 | | | | | |
| 22 | 5 7 8.04 | 2.3397 | 24 10 39.0 | 5.721 | | | | | |
| 23 | 5 9 28.48 | 2.3415 | 24 16 18.1 | 5.582 | | | | | |
| 24 | 5 11 49.02 | 2.3431 | N.24 21 48.8 | 5.442 | | | | | |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|--------------------------------------|-------|----------------|------------------|----------------|-------------------|----------------|-------------------|----------------|
| 1 | α Aquilæ W. 101° 21' 13" 3967 | | | 102° 46' 3" 3985 | | 104° 10' 32" 3306 | | 105° 34' 37" 3327 | |
| | Fomalhaut W. 70 27 7 2623 | | | 72 5 31 2636 | | 73 43 50 2630 | | 75 22 4 2635 | |
| | α Pegasi W. 53 41 49 3078 | | | 55 10 25 3060 | | 56 39 24 3043 | | 58 8 44 3028 | |
| | VENUS E. 35 53 41 2843 | | | 34 20 9 2852 | | 32 46 48 2861 | | 31 13 39 2869 | |
| | SUN E. 57 12 2 2754 | | | 55 36 34 2762 | | 54 1 16 2771 | | 52 26 10 2779 | |
| 2 | Fomalhaut W. 83 31 29 2663 | | | 85 8 58 2671 | | 86 46 17 2678 | | 88 23 26 2686 | |
| | α Pegasi W. 65 39 3 2984 | | | 67 9 36 2980 | | 68 40 14 2977 | | 70 10 56 2974 | |
| | α Arietis W. 22 16 53 3282 | | | 23 41 26 3188 | | 25 7 49 3114 | | 26 35 41 3056 | |
| | SUN E. 44 33 24 2623 | | | 42 59 26 2632 | | 41 25 40 2642 | | 39 52 6 2652 | |
| 3 | Fomalhaut W. 96 26 28 2730 | | | 98 2 28 2740 | | 99 38 15 2750 | | 101 13 48 2761 | |
| | α Pegasi W. 77 44 36 2981 | | | 79 15 13 2985 | | 80 45 45 2989 | | 82 16 12 2994 | |
| | α Arietis W. 34 9 22 2888 | | | 35 41 56 2871 | | 37 14 52 2857 | | 38 48 6 2846 | |
| | SUN E. 32 7 31 2934 | | | 30 35 17 2916 | | 29 3 19 2926 | | 27 31 36 2941 | |
| 4 | Fomalhaut W. 109 7 49 2821 | | | 110 41 49 2835 | | 112 15 31 2849 | | 113 48 55 2864 | |
| | α Pegasi W. 89 46 26 3032 | | | 91 15 59 3043 | | 92 45 19 3052 | | 94 14 27 3064 | |
| | α Arietis W. 46 36 51 2821 | | | 48 10 51 2821 | | 49 44 51 2832 | | 51 18 50 2824 | |
| | SUN E. 19 57 23 3019 | | | 18 27 34 3040 | | 16 58 11 3065 | | 15 29 19 3096 | |
| 7 | SUN W. 16 4 54 3224 | | | 17 29 13 3223 | | 18 53 33 3224 | | 20 17 52 3226 | |
| | Regulus E. 27 59 13 2931 | | | 26 27 34 2950 | | 24 56 18 2969 | | 23 25 26 2990 | |
| | Spica E. 81 57 0 2883 | | | 80 24 20 2893 | | 78 51 52 2903 | | 77 19 37 2912 | |
| | Antares E. 127 51 28 2881 | | | 126 18 45 2891 | | 124 46 14 2899 | | 123 13 54 2908 | |
| 8 | SUN W. 27 18 21 3322 | | | 28 42 7 3326 | | 30 5 46 3336 | | 31 29 16 3343 | |
| | Spica E. 69 41 23 2960 | | | 68 10 20 2969 | | 66 39 28 2978 | | 65 8 48 2987 | |
| | Antares E. 115 35 1 2951 | | | 114 3 47 2959 | | 112 32 43 2967 | | 111 1 49 2976 | |
| 9 | SUN W. 38 24 46 3377 | | | 39 47 29 3384 | | 41 10 4 3390 | | 42 32 32 3396 | |
| | Spica E. 57 38 9 3029 | | | 56 8 32 3037 | | 54 39 5 3044 | | 53 9 47 3052 | |
| | Antares E. 103 29 48 3013 | | | 101 59 51 3019 | | 100 30 2 3026 | | 99 0 21 3033 | |
| 10 | SUN W. 49 23 12 3423 | | | 50 45 2 3427 | | 52 6 48 3431 | | 53 28 29 3435 | |
| | Spica E. 45 45 34 3087 | | | 44 17 8 3094 | | 42 48 51 3101 | | 41 20 42 3108 | |
| | Antares E. 91 33 46 3059 | | | 90 4 46 3064 | | 88 35 52 3068 | | 87 7 3 3071 | |
| 11 | SUN W. 60 16 0 3447 | | | 61 37 23 3449 | | 62 58 44 3450 | | 64 20 4 3450 | |
| | Regulus W. 21 8 17 3177 | | | 22 34 54 3167 | | 24 1 43 3158 | | 25 28 43 3151 | |
| | Spica E. 34 1 51 3139 | | | 32 34 29 3147 | | 31 7 16 3154 | | 29 40 12 3162 | |
| | Antares E. 79 43 56 3085 | | | 78 15 28 3086 | | 76 47 1 3087 | | 75 18 35 3087 | |
| 12 | SUN W. 71 6 49 3446 | | | 72 28 14 3443 | | 73 49 42 3440 | | 75 11 13 3436 | |
| | Regulus W. 32 45 48 3118 | | | 34 13 36 3113 | | 35 41 30 3107 | | 37 9 31 3101 | |
| | Antares E. 67 56 28 3085 | | | 66 28 0 3089 | | 64 59 29 3081 | | 63 30 56 3078 | |
| | α Aquilæ E. 112 47 22 4036 | | | 111 36 8 4065 | | 110 24 33 3963 | | 109 12 37 3964 | |
| 13 | SUN W. 82 0 0 3412 | | | 83 22 3 3406 | | 84 44 13 3399 | | 86 6 31 3391 | |
| | Regulus W. 44 31 27 3069 | | | 46 0 15 3062 | | 47 29 11 3054 | | 48 58 17 3046 | |
| | Antares E. 56 7 7 3057 | | | 54 38 5 3052 | | 53 8 57 3047 | | 51 39 42 3040 | |
| | α Aquilæ E. 103 8 22 3878 | | | 101 54 40 3863 | | 100 40 43 3849 | | 99 26 31 3835 | |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|--------------|----------------|--------------|----------------|--------------|----------------|-------------|----------------|
| 1 | α Aquilæ W. | 106° 58' 17" | 3351 | 108° 21' 30" | 3376 | 109° 44' 14" | 3403 | 111° 6' 27" | 3439 |
| | Fomalhaut W. | 77 0 12 | 2640 | 78 38 13 | 2646 | 80 16 6 | 2651 | 81 53 52 | 2657 |
| | α Pegasi W. | 59 38 22 | 3016 | 61 8 15 | 3005 | 62 38 21 | 2997 | 64 8 38 | 2990 |
| | Venus E. | 29 40 41 | 2979 | 28 7 55 | 2989 | 26 35 22 | 2996 | 25 3 1 | 2998 |
| | Sun E. | 50 51 14 | 2787 | 49 16 29 | 2796 | 47 41 56 | 2805 | 46 7 34 | 2814 |
| 2 | Fomalhaut W. | 90 0 25 | 2994 | 91 37 13 | 2702 | 93 13 50 | 2711 | 94 50 15 | 2720 |
| | α Pegasi W. | 71 41 41 | 2973 | 73 12 27 | 2974 | 74 43 12 | 2976 | 76 13 55 | 2977 |
| | α Arietis W. | 28 4 45 | 3007 | 29 34 49 | 2968 | 31 5 42 | 2936 | 32 37 15 | 2909 |
| | Sun E. | 38 18 45 | 2861 | 36 45 36 | 2872 | 35 12 41 | 2882 | 33 39 59 | 2893 |
| 3 | Fomalhaut W. | 102 49 7 | 2772 | 104 24 11 | 2784 | 105 59 0 | 2796 | 107 33 33 | 2809 |
| | α Pegasi W. | 83 46 32 | 3001 | 85 16 44 | 3007 | 86 46 48 | 3015 | 88 16 42 | 3023 |
| | α Arietis W. | 40 21 34 | 2938 | 41 55 13 | 2931 | 43 29 0 | 2927 | 45 2 53 | 2923 |
| | Sun E. | 26 0 9 | 2954 | 24 28 59 | 2969 | 22 58 7 | 2985 | 21 27 35 | 3001 |
| 4 | Fomalhaut W. | 115 22 0 | 2879 | 116 54 46 | 2885 | 118 27 11 | 2912 | 119 50 15 | 2926 |
| | α Pegasi W. | 95 43 21 | 3075 | 97 12 1 | 3088 | 98 40 25 | 3101 | 100 8 33 | 3115 |
| | α Arietis W. | 52 52 47 | 2926 | 54 26 41 | 2929 | 56 0 31 | 2933 | 57 34 16 | 2938 |
| | Sun E. | 14 1 5 | 3136 | 12 33 39 | 3185 | 11 7 12 | 3243 | 9 41 54 | 3316 |
| 7 | Sun W. | 21 42 8 | 3300 | 23 6 20 | 3304 | 24 30 27 | 3310 | 25 54 27 | 3315 |
| | Regulus E. | 21 55 1 | 3014 | 20 25 6 | 3041 | 18 55 44 | 3071 | 17 26 59 | 3106 |
| | Spica E. | 75 47 34 | 2922 | 74 15 44 | 2931 | 72 44 5 | 2941 | 71 12 38 | 2950 |
| | Antares E. | 121 41 45 | 2916 | 120 9 47 | 2926 | 118 38 1 | 2935 | 117 6 26 | 2942 |
| 8 | Sun W. | 32 52 38 | 3350 | 34 15 52 | 3357 | 35 38 58 | 3364 | 37 1 56 | 3371 |
| | Spica E. | 63 38 19 | 2996 | 62 8 1 | 3004 | 60 37 53 | 3013 | 59 7 56 | 3021 |
| | Antares E. | 109 31 6 | 2984 | 108 0 33 | 2991 | 106 30 9 | 2998 | 104 59 54 | 3005 |
| 9 | Sun W. | 43 54 53 | 3402 | 45 17 7 | 3408 | 46 39 15 | 3414 | 48 1 16 | 3418 |
| | Spica E. | 51 40 39 | 3060 | 50 11 40 | 3066 | 48 42 49 | 3073 | 47 14 7 | 3081 |
| | Antares E. | 97 30 48 | 3038 | 96 1 22 | 3044 | 94 32 4 | 3049 | 93 2 52 | 3054 |
| 10 | Sun W. | 54 50 6 | 3438 | 56 11 39 | 3441 | 57 33 9 | 3444 | 58 54 36 | 3446 |
| | Spica E. | 39 52 40 | 3113 | 38 24 46 | 3119 | 36 57 0 | 3125 | 35 29 21 | 3133 |
| | Antares E. | 85 38 18 | 3075 | 84 9 38 | 3078 | 82 41 1 | 3080 | 81 12 27 | 3089 |
| 11 | Sun W. | 65 41 24 | 3450 | 67 2 44 | 3449 | 68 24 5 | 3449 | 69 45 26 | 3447 |
| | Regulus W. | 26 55 51 | 3143 | 28 23 8 | 3136 | 29 50 34 | 3130 | 31 18 7 | 3124 |
| | Spica E. | 28 13 17 | 3170 | 26 46 32 | 3180 | 25 19 59 | 3191 | 23 53 39 | 3204 |
| | Antares E. | 73 50 10 | 3087 | 72 21 45 | 3087 | 70 53 20 | 3087 | 69 24 55 | 3086 |
| 12 | Sun W. | 76 32 49 | 3439 | 77 54 29 | 3428 | 79 16 14 | 3423 | 80 38 4 | 3418 |
| | Regulus W. | 38 37 39 | 3096 | 40 5 54 | 3089 | 41 34 17 | 3089 | 43 2 48 | 3076 |
| | Antares E. | 62 2 19 | 3074 | 60 33 38 | 3071 | 59 4 53 | 3067 | 57 36 3 | 3062 |
| | α Aquilæ E. | 108 0 22 | 3045 | 106 47 48 | 3028 | 105 34 57 | 3011 | 104 21 48 | 2994 |
| 13 | Sun W. | 87 28 58 | 3383 | 88 51 34 | 3375 | 90 14 19 | 3368 | 91 37 14 | 3357 |
| | Regulus W. | 50 27 33 | 3038 | 51 56 59 | 3029 | 53 26 36 | 3019 | 54 56 25 | 3010 |
| | Antares E. | 50 10 19 | 3034 | 48 40 48 | 3027 | 47 11 9 | 3020 | 45 41 21 | 3013 |
| | α Aquilæ E. | 98 12 5 | 3021 | 96 57 25 | 3008 | 95 42 31 | 3005 | 94 27 24 | 2994 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
| 14 | Sun W. | 93 0 20 | 3347 | 94 23 37 | 3336 | 95 47 7 | 3335 | 97 10 49 | 3314 |
| | Regulus W. | 56 26 25 | 3000 | 57 56 38 | 2990 | 59 27 3 | 2979 | 60 57 42 | 2969 |
| | Antares E. | 44 11 24 | 3005 | 42 41 17 | 2996 | 41 10 59 | 2988 | 39 40 31 | 2979 |
| | α Aquilæ E. | 93 12 5 | 3773 | 91 56 34 | 3761 | 90 40 51 | 3750 | 89 24 57 | 3741 |
| 15 | Sun W. | 104 12 44 | 3252 | 105 37 52 | 3238 | 107 3 16 | 3224 | 108 28 57 | 3209 |
| | Regulus W. | 68 34 33 | 2907 | 70 6 43 | 2894 | 71 39 9 | 2880 | 73 11 53 | 2867 |
| | Spica W. | 15 12 59 | 3168 | 16 39 47 | 3112 | 18 7 42 | 3065 | 19 36 35 | 3023 |
| | Antares E. | 32 5 24 | 2935 | 30 33 49 | 2925 | 29 2 2 | 2917 | 27 30 5 | 2909 |
| | α Aquilæ E. | 83 3 1 | 3698 | 81 46 12 | 3692 | 80 29 16 | 3686 | 79 12 14 | 3681 |
| | Fomalhaut E. | 114 32 22 | 3097 | 113 4 9 | 3080 | 111 35 35 | 3062 | 110 6 39 | 3044 |
| 16 | Sun W. | 115 41 50 | 3139 | 117 9 21 | 3115 | 118 37 12 | 3099 | 120 5 23 | 3088 |
| | Regulus W. | 81 0 8 | 2793 | 82 34 45 | 2777 | 84 9 43 | 2762 | 85 45 1 | 2745 |
| | Spica W. | 27 12 18 | 2869 | 28 45 16 | 2845 | 30 18 45 | 2823 | 31 52 43 | 2800 |
| | α Aquilæ E. | 72 46 2 | 3670 | 71 28 43 | 3671 | 70 11 25 | 3674 | 68 54 10 | 3677 |
| | Fomalhaut E. | 102 36 34 | 2957 | 101 5 27 | 2940 | 99 33 59 | 2923 | 98 2 9 | 2905 |
| | α Pegasi E. | 120 4 3 | 3325 | 118 40 21 | 3294 | 117 16 3 | 3264 | 115 51 9 | 3233 |
| 17 | Sun W. | 127 31 30 | 2996 | 129 1 48 | 2979 | 130 32 27 | 2962 | 132 3 28 | 2943 |
| | Regulus W. | 93 46 58 | 2663 | 95 24 28 | 2646 | 97 2 21 | 2629 | 98 40 37 | 2612 |
| | Spica W. | 39 49 44 | 2695 | 41 26 31 | 2675 | 43 3 44 | 2656 | 44 41 23 | 2636 |
| | α Aquilæ E. | 62 29 42 | 3729 | 61 13 26 | 3746 | 59 57 28 | 3768 | 58 41 52 | 3792 |
| | Fomalhaut E. | 90 17 28 | 2820 | 88 43 26 | 2803 | 87 9 2 | 2786 | 85 34 16 | 2770 |
| | α Pegasi E. | 108 38 6 | 3097 | 107 9 53 | 3073 | 105 41 10 | 3048 | 104 11 57 | 3025 |
| 18 | Regulus W. | 106 57 47 | 2527 | 108 38 23 | 2510 | 110 19 23 | 2493 | 112 0 46 | 2477 |
| | Spica W. | 52 56 13 | 2541 | 54 36 29 | 2523 | 56 17 10 | 2504 | 57 58 17 | 2487 |
| | α Aquilæ E. | 52 31 35 | 3980 | 51 19 36 | 4036 | 50 8 32 | 4099 | 48 58 29 | 4169 |
| | Fomalhaut E. | 77 35 11 | 2692 | 75 58 21 | 2678 | 74 21 12 | 2664 | 72 43 44 | 2650 |
| | α Pegasi E. | 96 38 51 | 2917 | 95 6 54 | 2898 | 93 34 33 | 2880 | 92 1 48 | 2862 |
| 19 | Spica W. | 66 30 4 | 2401 | 68 13 38 | 2384 | 69 57 36 | 2368 | 71 41 56 | 2353 |
| | Antares W. | 20 43 54 | 2465 | 22 25 57 | 2437 | 24 8 39 | 2412 | 25 51 57 | 2389 |
| | Fomalhaut E. | 64 32 7 | 2593 | 62 53 3 | 2585 | 61 13 47 | 2577 | 59 34 20 | 2570 |
| | α Pegasi E. | 84 12 40 | 2785 | 82 37 52 | 2772 | 81 2 48 | 2761 | 79 27 29 | 2750 |
| 20 | Spica W. | 80 29 8 | 2280 | 82 15 37 | 2267 | 84 2 25 | 2254 | 85 49 32 | 2241 |
| | Antares W. | 34 36 1 | 2294 | 36 22 9 | 2279 | 38 8 40 | 2264 | 39 55 33 | 2249 |
| | Fomalhaut E. | 51 15 23 | 2558 | 49 35 30 | 2561 | 47 55 42 | 2567 | 46 16 2 | 2576 |
| | α Pegasi E. | 71 27 55 | 2716 | 69 51 37 | 2713 | 68 15 15 | 2713 | 66 38 52 | 2714 |
| | α Arietis E. | 113 25 48 | 2380 | 111 41 44 | 2363 | 109 57 16 | 2348 | 108 12 26 | 2333 |
| 21 | Spica W. | 94 49 26 | 2189 | 96 38 10 | 2180 | 98 27 8 | 2172 | 100 16 18 | 2164 |
| | Antares W. | 48 54 55 | 2189 | 50 43 39 | 2178 | 52 32 39 | 2170 | 54 21 52 | 2161 |
| | α Pegasi E. | 58 38 14 | 2751 | 57 2 42 | 2767 | 55 27 31 | 2785 | 53 52 44 | 2808 |
| | α Arietis E. | 99 23 23 | 2272 | 97 36 43 | 2263 | 95 49 49 | 2253 | 94 2 41 | 2245 |
| 22 | Spica W. | 109 24 45 | 2135 | 111 14 51 | 2132 | 113 5 2 | 2128 | 114 55 19 | 2126 |
| | Antares W. | 63 30 58 | 2127 | 65 21 16 | 2122 | 67 11 41 | 2118 | 69 2 13 | 2115 |
| | α Arietis E. | 85 4 16 | 2215 | 83 16 11 | 2211 | 81 28 0 | 2208 | 79 39 45 | 2206 |
| | Aldebaran E. | 115 32 44 | 2140 | 113 42 46 | 2136 | 111 52 41 | 2131 | 110 2 29 | 2127 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|-------------|----------------|--------------|----------------|--------------|----------------|
| 14 | SUN W. | 98° 34' 44" | 3303 | 99° 58' 52" | 3290 | 101° 23' 15" | 3278 | 102° 47' 52" | 3265 |
| | Regulus W. | 62 28 34 | 2957 | 63 59 41 | 2945 | 65 31 3 | 2933 | 67 2 40 | 2920 |
| | Antares E. | 38 9 52 | 2970 | 36 39 2 | 2969 | 35 8 1 | 2959 | 33 36 48 | 2943 |
| | α Aquilæ E. | 88 8 53 | 3731 | 86 52 39 | 3722 | 85 36 15 | 3713 | 84 19 42 | 3706 |
| 15 | SUN W. | 109 54 56 | 3194 | 111 21 12 | 3179 | 112 47 46 | 3164 | 114 14 38 | 3148 |
| | Regulus W. | 74 44 54 | 2852 | 76 18 14 | 2838 | 77 51 53 | 2823 | 79 25 51 | 2808 |
| | Spica W. | 21 6 19 | 2985 | 22 36 50 | 2953 | 24 8 2 | 2993 | 25 39 52 | 2894 |
| | Antares E. | 25 57 57 | 2901 | 24 25 40 | 2896 | 22 53 16 | 2891 | 21 20 46 | 2889 |
| | α Aquilæ E. | 77 55 7 | 3677 | 76 37 55 | 3673 | 75 20 39 | 3671 | 74 3 21 | 3670 |
| | Fomalhaut E. | 108 37 21 | 3097 | 107 7 42 | 3090 | 105 37 41 | 2992 | 104 7 18 | 2975 |
| 16 | SUN W. | 121 33 54 | 3065 | 123 2 47 | 3048 | 124 32 0 | 3031 | 126 1 34 | 3014 |
| | Regulus W. | 87 20 41 | 2729 | 88 56 42 | 2713 | 90 33 5 | 2696 | 92 9 50 | 2679 |
| | Spica W. | 33 27 11 | 2779 | 35 2 7 | 2756 | 36 37 32 | 2736 | 38 13 24 | 2715 |
| | α Aquilæ E. | 67 36 59 | 3684 | 66 19 55 | 3692 | 65 2 59 | 3702 | 63 46 14 | 3714 |
| | Fomalhaut E. | 96 29 57 | 2988 | 94 57 23 | 2971 | 93 24 27 | 2853 | 91 51 8 | 2837 |
| | α Pegasi E. | 114 25 39 | 3204 | 112 59 35 | 3177 | 111 32 58 | 3149 | 110 5 48 | 3123 |
| 17 | SUN W. | 133 34 52 | 2996 | 135 6 38 | 2909 | 136 38 45 | 2892 | 138 11 14 | 2875 |
| | Regulus W. | 100 19 16 | 2594 | 101 58 19 | 2577 | 103 37 45 | 2561 | 105 17 34 | 2543 |
| | Spica W. | 46 19 29 | 2617 | 47 58 1 | 2598 | 49 36 59 | 2579 | 51 16 23 | 2560 |
| | α Aquilæ E. | 57 26 41 | 3690 | 56 12 0 | 3653 | 54 57 52 | 3690 | 53 44 22 | 3632 |
| | Fomalhaut E. | 83 59 9 | 2753 | 82 23 40 | 2738 | 80 47 51 | 2729 | 79 11 41 | 2707 |
| | α Pegasi E. | 102 42 15 | 3002 | 101 12 5 | 2980 | 99 41 27 | 2958 | 98 10 22 | 2938 |
| 18 | Regulus W. | 113 42 32 | 2480 | 115 24 42 | 2444 | 117 7 14 | 2428 | 118 50 9 | 2412 |
| | Spica W. | 59 39 49 | 2409 | 61 21 46 | 2451 | 63 4 8 | 2434 | 64 46 54 | 2417 |
| | α Aquilæ E. | 47 49 34 | 2950 | 46 41 55 | 2431 | 45 35 40 | 2445 | 44 30 59 | 2453 |
| | Fomalhaut E. | 71 5 57 | 2638 | 69 27 53 | 2626 | 67 49 33 | 2614 | 66 10 57 | 2604 |
| | α Pegasi E. | 90 28 41 | 2845 | 88 55 11 | 2828 | 87 21 20 | 2813 | 85 47 9 | 2799 |
| 19 | Spica W. | 73 26 39 | 2337 | 75 11 44 | 2322 | 76 57 11 | 2308 | 78 42 59 | 2294 |
| | Antares W. | 27 35 48 | 2367 | 29 20 10 | 2348 | 31 5 0 | 2338 | 32 50 18 | 2311 |
| | Fomalhaut E. | 57 54 44 | 2564 | 56 15 0 | 2561 | 54 35 11 | 2558 | 52 55 18 | 2556 |
| | α Pegasi E. | 77 51 56 | 2741 | 76 16 10 | 2733 | 74 40 14 | 2725 | 73 4 8 | 2720 |
| 20 | Spica W. | 87 36 58 | 2230 | 89 24 41 | 2219 | 91 12 40 | 2206 | 93 0 55 | 2198 |
| | Antares W. | 41 42 47 | 2236 | 43 30 21 | 2223 | 45 18 15 | 2210 | 47 6 27 | 2200 |
| | Fomalhaut E. | 44 36 34 | 2588 | 42 57 22 | 2603 | 41 18 31 | 2603 | 39 40 7 | 2646 |
| | α Pegasi E. | 65 2 31 | 2717 | 63 26 14 | 2722 | 61 50 3 | 2729 | 60 14 2 | 2739 |
| | α Arietis E. | 106 27 15 | 2320 | 104 41 44 | 2307 | 102 55 55 | 2295 | 101 9 48 | 2283 |
| 21 | Spica W. | 102 5 40 | 2157 | 103 55 13 | 2151 | 105 44 55 | 2145 | 107 34 46 | 2139 |
| | Antares W. | 56 11 19 | 2153 | 58 0 58 | 2145 | 59 50 48 | 2139 | 61 40 48 | 2132 |
| | α Pegasi E. | 52 18 27 | 2635 | 50 44 44 | 2666 | 49 11 41 | 2691 | 47 39 24 | 2642 |
| | α Arietis E. | 92 15 20 | 2237 | 90 27 48 | 2231 | 88 40 6 | 2225 | 86 52 15 | 2219 |
| 22 | Spica W. | 116 45 39 | 2124 | 118 36 2 | 2123 | 120 26 26 | 2122 | 122 16 51 | 2123 |
| | Antares W. | 70 52 50 | 2112 | 72 43 31 | 2109 | 74 34 16 | 2108 | 76 25 3 | 2107 |
| | α Arietis E. | 77 51 27 | 2206 | 76 3 8 | 2205 | 74 14 48 | 2206 | 72 26 29 | 2207 |
| | Aldebaran E. | 108 12 11 | 2124 | 106 21 48 | 2122 | 104 31 22 | 2120 | 102 40 53 | 2119 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|------------|----------------|-------------|----------------|-------------|----------------|
| 23 | Antares W. | 78° 15' 51" | 2107 | 80° 6' 40" | 2107 | 81° 57' 28" | 2108 | 83° 48' 15" | 2109 |
| | α Aquilæ W. | 42 48 0 | 4354 | 43 54 3 | 4302 | 45 2 27 | 4067 | 46 13 1 | 3946 |
| | α Arietis E. | 70 38 12 | 2210 | 68 49 59 | 2212 | 67 1 50 | 2217 | 65 13 48 | 2223 |
| | Aldebaran E. | 100 50 23 | 2118 | 98 59 52 | 2118 | 97 9 21 | 2119 | 95 18 51 | 2121 |
| 24 | Antares W. | 93 1 20 | 2125 | 94 51 41 | 2130 | 96 41 55 | 2136 | 98 32 0 | 2141 |
| | α Aquilæ W. | 52 32 23 | 3514 | 53 52 32 | 3454 | 55 13 48 | 3400 | 56 36 5 | 3352 |
| | α Arietis E. | 56 16 5 | 2264 | 54 29 12 | 2276 | 52 42 37 | 2269 | 50 56 21 | 2203 |
| | Aldebaran E. | 86 7 15 | 2137 | 84 17 12 | 2141 | 82 27 16 | 2147 | 80 37 29 | 2153 |
| | Sun E. | 139 18 2 | 2431 | 137 35 12 | 2435 | 135 52 27 | 2439 | 134 9 48 | 2444 |
| 25 | Antares W. | 107 40 3 | 2176 | 109 29 6 | 2184 | 111 17 57 | 2183 | 113 6 35 | 2209 |
| | α Aquilæ W. | 63 39 22 | 3185 | 65 5 49 | 3163 | 66 32 43 | 3144 | 67 59 59 | 3128 |
| | Fomalhaut W. | 28 34 53 | 2997 | 30 5 10 | 2916 | 31 37 8 | 2852 | 33 10 29 | 2798 |
| | α Arietis E. | 42 11 3 | 2401 | 40 27 29 | 2428 | 38 44 34 | 2457 | 37 2 20 | 2490 |
| | Aldebaran E. | 71 31 0 | 2190 | 69 42 17 | 2198 | 67 53 47 | 2207 | 66 5 30 | 2216 |
| | Sun E. | 125 38 31 | 2476 | 123 56 44 | 2485 | 122 15 9 | 2493 | 120 33 46 | 2502 |
| 26 | α Aquilæ W. | 75 20 7 | 3086 | 76 48 34 | 3083 | 78 17 4 | 3083 | 79 45 34 | 3084 |
| | Fomalhaut W. | 41 11 11 | 2643 | 42 49 8 | 2626 | 44 27 28 | 2612 | 46 6 6 | 2603 |
| | Aldebaran E. | 57 7 48 | 2270 | 55 21 4 | 2281 | 53 34 37 | 2293 | 51 48 27 | 2306 |
| | Sun E. | 112 10 3 | 2551 | 110 30 0 | 2561 | 108 50 12 | 2572 | 107 10 39 | 2584 |
| 27 | α Aquilæ W. | 87 7 3 | 3114 | 88 34 56 | 3124 | 90 2 36 | 3135 | 91 30 3 | 3148 |
| | Fomalhaut W. | 54 21 40 | 2583 | 56 0 58 | 2584 | 57 40 15 | 2586 | 59 19 29 | 2588 |
| | α Pegasi W. | 39 39 27 | 3438 | 41 1 0 | 3373 | 42 23 47 | 3317 | 43 47 39 | 3268 |
| | Aldebaran E. | 43 2 23 | 2373 | 41 18 10 | 2389 | 39 34 19 | 2404 | 37 50 51 | 2421 |
| | Venus E. | 84 34 20 | 2726 | 82 58 15 | 2739 | 81 22 27 | 2752 | 79 46 56 | 2764 |
| | Sun E. | 98 56 49 | 2642 | 97 18 51 | 2654 | 95 41 9 | 2666 | 94 3 44 | 2678 |
| 28 | α Aquilæ W. | 98 42 58 | 3221 | 100 8 31 | 3251 | 101 33 40 | 3272 | 102 58 24 | 3285 |
| | Fomalhaut W. | 67 34 21 | 2614 | 69 12 57 | 2621 | 70 51 23 | 2629 | 72 29 39 | 2637 |
| | α Pegasi W. | 50 59 3 | 3107 | 52 27 4 | 3087 | 53 55 30 | 3070 | 55 24 16 | 3056 |
| | Venus E. | 71 53 28 | 2828 | 70 19 36 | 2841 | 68 46 1 | 2854 | 67 12 43 | 2866 |
| | Sun E. | 86 0 45 | 2741 | 84 24 59 | 2753 | 82 49 29 | 2766 | 84 14 16 | 2779 |
| 29 | Fomalhaut W. | 80 38 10 | 2681 | 82 15 16 | 2691 | 83 52 8 | 2701 | 85 28 47 | 2710 |
| | α Pegasi W. | 62 51 37 | 3015 | 64 21 31 | 3013 | 65 51 28 | 3011 | 67 21 27 | 3009 |
| | Venus E. | 59 30 16 | 2930 | 57 58 35 | 2942 | 56 27 10 | 2955 | 54 56 1 | 2968 |
| | Sun E. | 73 22 15 | 2640 | 71 48 39 | 2652 | 70 15 18 | 2664 | 68 42 13 | 2676 |
| 30 | Fomalhaut W. | 93 28 37 | 2764 | 95 3 52 | 2775 | 96 38 53 | 2787 | 98 13 38 | 2798 |
| | α Pegasi W. | 74 51 17 | 3020 | 76 21 5 | 3024 | 77 50 48 | 3029 | 79 20 25 | 3034 |
| | α Arietis W. | 31 13 58 | 2970 | 32 44 48 | 2949 | 34 16 5 | 2931 | 35 47 44 | 2916 |
| | Venus E. | 47 24 10 | 3030 | 45 54 34 | 3042 | 44 25 13 | 3055 | 42 56 8 | 3066 |
| | Sun E. | 61 0 41 | 2936 | 59 29 8 | 2949 | 57 57 51 | 2960 | 56 26 48 | 2972 |
| 31 | Fomalhaut W. | 106 3 31 | 2860 | 107 36 41 | 2873 | 109 9 34 | 2887 | 110 42 10 | 2900 |
| | α Pegasi W. | 86 46 31 | 3071 | 88 15 16 | 3080 | 89 43 50 | 3090 | 91 12 12 | 3099 |
| | α Arietis W. | 43 29 29 | 2882 | 45 2 11 | 2880 | 46 34 56 | 2879 | 48 7 42 | 2878 |
| | Venus E. | 35 34 24 | 3128 | 34 6 48 | 3141 | 32 39 28 | 3153 | 31 12 23 | 3167 |
| | Sun E. | 48 55 14 | 3030 | 47 25 39 | 3042 | 45 56 18 | 3054 | 44 27 12 | 3065 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
| 23 | Antares W. | 85° 39' 0" | 2111 | 87° 29' 42" | 2114 | 89° 20' 20" | 2117 | 91° 10' 53" | 2121 |
| | α Aquilæ W. | 47 25 34 | 2339 | 48 39 56 | 2744 | 49 55 57 | 2658 | 51 13 29 | 2542 |
| | α Arietis E. | 63 25 54 | 2222 | 61 38 9 | 2226 | 59 50 35 | 2244 | 58 3 13 | 2253 |
| | Aldebaran E. | 93 28 24 | 2123 | 91 38 0 | 2126 | 89 47 40 | 2129 | 87 57 25 | 2132 |
| 24 | Antares W. | 100 21 57 | 2147 | 102 11 44 | 2154 | 104 1 21 | 2161 | 105 50 48 | 2169 |
| | α Aquilæ W. | 57 59 16 | 2309 | 59 23 17 | 2372 | 60 48 1 | 2329 | 62 13 24 | 2309 |
| | α Arietis E. | 49 10 26 | 2219 | 47 24 54 | 2237 | 45 39 48 | 2256 | 43 55 10 | 2278 |
| | Aldebaran E. | 78 47 50 | 2159 | 76 58 21 | 2167 | 75 9 3 | 2174 | 73 19 56 | 2181 |
| | SUN E. | 132 27 16 | 2449 | 130 44 51 | 2455 | 129 2 35 | 2462 | 127 20 28 | 2469 |
| 25 | Antares W. | 114 54 59 | 2212 | 116 43 9 | 2221 | 118 31 5 | 2231 | 120 18 46 | 2242 |
| | α Aquilæ W. | 69 27 35 | 2314 | 70 55 27 | 2305 | 72 23 31 | 2306 | 73 51 45 | 2309 |
| | Fomalhaut W. | 34 44 59 | 2754 | 36 20 27 | 2717 | 37 56 44 | 2687 | 39 33 41 | 2663 |
| | α Arietis E. | 35 20 53 | 2527 | 33 40 18 | 2569 | 32 0 41 | 2617 | 30 22 9 | 2673 |
| | Aldebaran E. | 64 17 27 | 2227 | 62 29 39 | 2237 | 60 42 6 | 2247 | 58 54 49 | 2258 |
| | SUN E. | 118 52 35 | 2511 | 117 11 37 | 2520 | 115 30 52 | 2530 | 113 50 20 | 2540 |
| 26 | α Aquilæ W. | 81 14 3 | 2087 | 82 42 28 | 2091 | 84 10 48 | 2098 | 85 39 0 | 2105 |
| | Fomalhaut W. | 47 44 57 | 2595 | 49 23 59 | 2589 | 51 3 9 | 2586 | 52 42 23 | 2584 |
| | Aldebaran E. | 50 2 36 | 2218 | 48 17 3 | 2232 | 46 31 50 | 2245 | 44 46 56 | 2259 |
| | SUN E. | 105 31 22 | 2596 | 103° 52 20 | 2607 | 102 13 34 | 2618 | 100 35 3 | 2630 |
| 27 | α Aquilæ W. | 92 57 14 | 2162 | 94 24 9 | 2178 | 95 50 45 | 2193 | 97 17 2 | 2211 |
| | Fomalhaut W. | 60 58 40 | 2592 | 62 37 46 | 2597 | 64 16 45 | 2602 | 65 55 37 | 2608 |
| | α Pegasi W. | 45 12 28 | 2325 | 46 38 7 | 2388 | 48 4 30 | 2358 | 49 31 30 | 2330 |
| | Aldebaran E. | 36 7 45 | 2438 | 34 25 4 | 2455 | 32 42 48 | 2474 | 31 0 58 | 2494 |
| | VENUS E. | 78 11 41 | 2777 | 76 36 43 | 2789 | 75 2 1 | 2802 | 73 27 36 | 2815 |
| | SUN E. | 92 26 35 | 2691 | 90 49 43 | 2703 | 89 13 7 | 2716 | 87 36 48 | 2728 |
| 28 | α Aquilæ W. | 104 22 41 | 2320 | 105 46 29 | 2345 | 107 9 48 | 2373 | 108 32 35 | 2402 |
| | Fomalhaut W. | 74 7 44 | 2645 | 75 45 38 | 2653 | 77 23 21 | 2662 | 79 0 52 | 2672 |
| | α Pegasi W. | 56 53 20 | 2044 | 58 22 38 | 2034 | 59 52 9 | 2026 | 61 21 49 | 2020 |
| | VENUS E. | 65 39 41 | 2679 | 64 6 55 | 2692 | 62 34 26 | 2705 | 61 2 13 | 2717 |
| | SUN E. | 79 39 20 | 2790 | 78 4 39 | 2803 | 76 30 15 | 2815 | 74 56 7 | 2828 |
| 29 | Fomalhaut W. | 87 5 13 | 2721 | 88 41 25 | 2732 | 90 17 23 | 2742 | 91 53' 7 | 2753 |
| | α Pegasi W. | 68 51 28 | 2009 | 70 21 29 | 2011 | 71 51 28 | 2014 | 73 21 24 | 2016 |
| | VENUS E. | 53 25 8 | 2280 | 51 54 30 | 2293 | 50 24 8 | 2305 | 48 54 1 | 2318 |
| | SUN E. | 67 9 24 | 2888 | 65 36 50 | 2901 | 64 4 32 | 2912 | 62 32 29 | 2924 |
| 30 | Fomalhaut W. | 99 48 8 | 2810 | 101 22 23 | 2822 | 102 56 22 | 2835 | 104 30 5 | 2848 |
| | α Pegasi W. | 80 49 55 | 2041 | 82 19 17 | 2047 | 83 48 31 | 2055 | 85 17 36 | 2063 |
| | α Arietis W. | 37 19 42 | 2905 | 38 51 54 | 2896 | 40 24 18 | 2890 | 41 56 50 | 2884 |
| | VENUS E. | 41 27 17 | 2078 | 39 58 41 | 2091 | 38 30 20 | 2103 | 37 2 14 | 2116 |
| | SUN E. | 54 56 0 | 2984 | 53 25 27 | 2995 | 51 55 8 | 3007 | 50 25 4 | 3018 |
| 31 | Fomalhaut W. | 112 14 29 | 2914 | 113 46 30 | 2929 | 115 18 12 | 2943 | 116 49 36 | 2958 |
| | α Pegasi W. | 92 40 23 | 2110 | 94 8 21 | 2120 | 95 36 6 | 2129 | 97 3 37 | 2143 |
| | α Arietis W. | 49 40 29 | 2879 | 51 13 15 | 2881 | 52 45 58 | 2883 | 54 18 38 | 2887 |
| | VENUS E. | 29 45 34 | 2180 | 28 19 1 | 2194 | 26 52 45 | 2208 | 25 26 45 | 2222 |
| | SUN E. | 42 58 20 | 3078 | 41 29 43 | 3089 | 40 1 20 | 3101 | 38 33 12 | 3114 |

AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | | Sidereal Time of Semi-diameter Passing Meridian. | Equation of Time, to be Added to | | Diff. for 1 Hour. |
|------------------|-------------------|---|-------------------|-----------------------|-------------------|----------------|--------------------------------|--|----------------------------------|--|-------------------|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | Semi-diameter. | Subtracted from Apparent Time. | | | | |
| | | | | | | | | | | | |
| Sat. | 1 | ^h 8 ^m 45 ^s 21.43 | 9.714 | N. 18° 2' 35.9" | -37.74 | 15' 47.97" | 66.64 | ^m 6 ^s 6.63 | 0.143 | | |
| SUN. | 2 | 8 49 14.25 | 9.689 | 17 47 21.2 | 38.47 | 15 48.09 | 66.56 | 6 2.91 | 0.168 | | |
| Mon. | 3 | 8 53 6.48 | 9.664 | 17 31 49.1 | 39.19 | 15 48.22 | 66.47 | 5 58.60 | 0.193 | | |
| Tues. | 4 | 8 56 58.11 | 9.640 | 17 15 59.8 | -39.90 | 15 48.35 | 66.38 | 5 53.69 | 0.218 | | |
| Wed. | 5 | 9 0 49.15 | 9.615 | 16 59 53.7 | 40.60 | 15 48.49 | 66.29 | 5 48.19 | 0.242 | | |
| Thur. | 6 | 9 4 39.58 | 9.590 | 16 43 31.0 | 41.29 | 15 48.64 | 66.21 | 5 42.08 | 0.267 | | |
| Frid. | 7 | 9 8 29.41 | 9.564 | 16 26 52.1 | -41.96 | 15 48.79 | 66.12 | 5 35.36 | 0.292 | | |
| Sat. | 8 | 9 12 18.63 | 9.538 | 16 9 57.3 | 42.61 | 15 48.94 | 66.04 | 5 28.04 | 0.318 | | |
| SUN. | 9 | 9 16 7.26 | 9.513 | 15 52 46.9 | 43.25 | 15 49.10 | 65.95 | 5 20.13 | 0.343 | | |
| Mon. | 10 | 9 19 55.30 | 9.488 | 15 35 21.3 | -43.88 | 15 49.27 | 65.87 | 5 11.63 | 0.367 | | |
| Tues. | 11 | 9 23 42.74 | 9.464 | 15 17 40.7 | 44.50 | 15 49.44 | 65.79 | 5 2.55 | 0.392 | | |
| Wed. | 12 | 9 27 29.59 | 9.440 | 14 59 45.5 | 45.10 | 15 49.61 | 65.71 | 4 52.88 | 0.416 | | |
| Thur. | 13 | 9 31 15.87 | 9.416 | 14 41 36.0 | -45.68 | 15 49.79 | 65.63 | 4 42.63 | 0.440 | | |
| Frid. | 14 | 9 35 1.58 | 9.393 | 14 23 12.5 | 46.26 | 15 49.97 | 65.55 | 4 31.82 | 0.463 | | |
| Sat. | 15 | 9 38 46.74 | 9.370 | 14 4 35.4 | 46.83 | 15 50.15 | 65.47 | 4 20.45 | 0.486 | | |
| SUN. | 16 | 9 42 31.35 | 9.348 | 13 45 44.9 | -47.38 | 15 50.33 | 65.39 | 4 8.54 | 0.508 | | |
| Mon. | 17 | 9 46 15.43 | 9.326 | 13 26 41.4 | 47.91 | 15 50.52 | 65.31 | 3 56.09 | 0.530 | | |
| Tues. | 18 | 9 49 58.98 | 9.305 | 13 7 25.2 | 48.43 | 15 50.71 | 65.24 | 3 43.13 | 0.551 | | |
| Wed. | 19 | 9 53 42.03 | 9.285 | 12 47 56.6 | -48.94 | 15 50.90 | 65.17 | 3 29.66 | 0.571 | | |
| Thur. | 20 | 9 57 24.59 | 9.265 | 12 28 15.9 | 49.44 | 15 51.09 | 65.10 | 3 15.71 | 0.591 | | |
| Frid. | 21 | 10 1 6.68 | 9.246 | 12 8 23.3 | 49.93 | 15 51.28 | 65.03 | 3 1.29 | 0.610 | | |
| Sat. | 22 | 10 4 48.33 | 9.227 | 11 48 19.2 | -50.41 | 15 51.48 | 64.97 | 2 46.41 | 0.629 | | |
| SUN. | 23 | 10 8 29.53 | 9.208 | 11 28 3.8 | 50.87 | 15 51.68 | 64.90 | 2 31.09 | 0.647 | | |
| Mon. | 24 | 10 12 10.30 | 9.190 | 11 7 37.5 | 51.32 | 15 51.88 | 64.84 | 2 15.35 | 0.665 | | |
| Tues. | 25 | 10 15 50.66 | 9.173 | 10 47 0.5 | -51.76 | 15 52.08 | 64.78 | 1 59.20 | 0.682 | | |
| Wed. | 26 | 10 19 30.63 | 9.157 | 10 26 13.2 | 52.18 | 15 52.29 | 64.72 | 1 42.66 | 0.698 | | |
| Thur. | 27 | 10 23 10.22 | 9.142 | 10 5 15.8 | 52.59 | 15 52.50 | 64.66 | 1 25.74 | 0.713 | | |
| Frid. | 28 | 10 26 49.45 | 9.127 | 9 44 8.7 | -52.99 | 15 52.71 | 64.61 | 1 8.47 | 0.728 | | |
| Sat. | 29 | 10 30 28.34 | 9.113 | 9 22 52.2 | 53.37 | 15 52.92 | 64.56 | 0 50.86 | 0.742 | | |
| SUN. | 30 | 10 34 6.89 | 9.100 | 9 1 26.6 | 53.75 | 15 53.14 | 64.51 | 0 32.92 | 0.755 | | |
| Mon. | 31 | 10 37 45.13 | 9.087 | 8 39 52.3 | 54.11 | 15 53.36 | 64.46 | 0 14.65 | 0.768 | | |
| Tues. | 32 | 10 41 23.07 | 9.074 | N. 8 18 9.5 | -54.45 | 15 53.59 | 64.41 | 0 3.93 | 0.781 | | |

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.18 from the sidereal time.

The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, to be Subtracted from | Diff. for 1 Hour. | Sidereal Time, or Right Ascension of Mean Sun. |
|------------------|-------------------|------------------------------|----------------------|-------------------------|----------------------|--|----------------------|---|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination | Diff. for 1 Hour. | | | |
| | | h m s | s | ° ' " | " | m s | s | h m s |
| Sat. | 1 | 8 45 20.44 | 9.714 | N. 18 2 39.7 | -37.74 | 6 6.64 | 0.143 | 8 39 13.80 |
| SUN. | 2 | 8 49 13.28 | 9.689 | 17 47 25.1 | 38.47 | 6 2.92 | 0.168 | 8 43 10.36 |
| Mon. | 3 | 8 53 5.52 | 9.664 | 17 31 53.0 | 39.19 | 5 58.61 | 0.193 | 8 47 6.91 |
| Tues. | 4 | 8 56 57.17 | 9.640 | 17 16 3.7 | -39.90 | 5 53.71 | 0.218 | 8 51 3.46 |
| Wed. | 5 | 9 0 48.22 | 9.615 | 16 59 57.6 | 40.60 | 5 48.21 | 0.242 | 8 55 0.01 |
| Thur. | 6 | 9 4 38.67 | 9.590 | 16 43 34.9 | 41.29 | 5 42.10 | 0.267 | 8 58 56.57 |
| Frid. | 7 | 9 8 28.52 | 9.565 | 16 26 56.0 | -41.96 | 5 35.39 | 0.292 | 9 2 53.13 |
| Sat. | 8 | 9 12 17.76 | 9.539 | 16 10 1.1 | 42.61 | 5 28.07 | 0.318 | 9 6 49.69 |
| SUN. | 9 | 9 16 6.41 | 9.514 | 15 52 50.7 | 43.25 | 5 20.16 | 0.343 | 9 10 46.25 |
| Mon. | 10 | 9 19 54.47 | 9.490 | 15 35 25.0 | -43.88 | 5 11.66 | 0.367 | 9 14 42.81 |
| Tues. | 11 | 9 23 41.94 | 9.465 | 15 17 44.4 | 44.50 | 5 2.58 | 0.392 | 9 18 39.36 |
| Wed. | 12 | 9 27 28.82 | 9.441 | 14 59 49.1 | 45.10 | 4 52.91 | 0.416 | 9 22 35.91 |
| Thur. | 13 | 9 31 15.13 | 9.417 | 14 41 39.5 | -45.68 | 4 42.66 | 0.440 | 9 26 32.47 |
| Frid. | 14 | 9 35 0.87 | 9.394 | 14 23 16.0 | 46.26 | 4 31.85 | 0.463 | 9 30 29.02 |
| Sat. | 15 | 9 38 46.06 | 9.371 | 14 4 38.8 | 46.83 | 4 20.48 | 0.486 | 9 34 25.58 |
| SUN. | 16 | 9 42 30.70 | 9.349 | 13 45 48.2 | -47.38 | 4 8.57 | 0.508 | 9 38 22.13 |
| Mon. | 17 | 9 46 14.81 | 9.327 | 13 26 44.6 | 47.92 | 3 56.12 | 0.530 | 9 42 18.69 |
| Tues. | 18 | 9 49 58.40 | 9.306 | 13 7 28.3 | 48.44 | 3 43.16 | 0.551 | 9 46 15.24 |
| Wed. | 19 | 9 53 41.49 | 9.286 | 12 47 59.5 | -48.95 | 3 29.69 | 0.571 | 9 50 11.80 |
| Thur. | 20 | 9 57 24.09 | 9.266 | 12 28 18.6 | 49.45 | 3 15.74 | 0.591 | 9 54 8.35 |
| Frid. | 21 | 10 1 6.22 | 9.247 | 12 8 25.8 | 49.94 | 3 1.32 | 0.610 | 9 58 4.90 |
| Sat. | 22 | 10 4 47.90 | 9.228 | 11 48 21.5 | -50.42 | 2 46.44 | 0.629 | 10 2 1.46 |
| SUN. | 23 | 10 8 29.14 | 9.210 | 11 28 5.9 | 50.88 | 2 31.12 | 0.647 | 10 5 58.02 |
| Mon. | 24 | 10 12 9.95 | 9.192 | 11 7 39.4 | 51.33 | 2 15.38 | 0.665 | 10 9 54.57 |
| Tues. | 25 | 10 15 50.35 | 9.175 | 10 47 2.2 | -51.77 | 1 59.22 | 0.682 | 10 13 51.13 |
| Wed. | 26 | 10 19 30.36 | 9.159 | 10 26 14.7 | 52.19 | 1 42.68 | 0.698 | 10 17 47.68 |
| Thur. | 27 | 10 23 10.00 | 9.144 | 10 5 17.1 | 52.60 | 1 25.76 | 0.713 | 10 21 44.24 |
| Frid. | 28 | 10 26 49.28 | 9.129 | 9 44 9.7 | -53.00 | 1 8.49 | 0.728 | 10 25 40.79 |
| Sat. | 29 | 10 30 28.21 | 9.115 | 9 22 52.9 | 53.38 | 0 50.87 | 0.742 | 10 29 37.34 |
| SUN. | 30 | 10 34 6.81 | 9.102 | 9 1 27.1 | 53.76 | 0 32.92 | 0.755 | 10 33 33.89 |
| Mon. | 31 | 10 37 45.10 | 9.089 | 8 39 52.5 | 54.12 | 0 14.65 | 0.768 | 10 37 30.45 |
| Tues. | 32 | 10 41 23.08 | 9.076 | N. 8 18 9.4 | -54.46 | 0 3.93 | 0.781 | 10 41 27.01 |

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 hour,
+9°.8565.
(Table III.)

| AT GREENWICH MEAN NOON. | | | | | | | | | |
|--|------------------|-----------------|------------|-------------------|-----------|-----------|--|-------------------|---|
| Day of the Month. | Day of the Year. | THE SUN'S | | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 Hour. | Mean Time of Sidereal Noon |
| | | TRUE LONGITUDE. | | Diff. for 1 Hour. | LATITUDE. | | | | |
| | | λ | λ' | | | | | | |
| 1 | 213 | 128° 54' 24.4 | 54' 8.9 | 143.59 | + 0.31 | 0.0063828 | -23.1 | 15 18 15.36 | |
| 2 | 214 | 129 51 51.2 | 51 35.6 | 143.64 | 0.42 | 0.0063261 | 24.1 | 15 14 19.45 | |
| 3 | 215 | 130 49 19.1 | 49 3.4 | 143.68 | 0.51 | 0.0062670 | 25.1 | 15 10 23.54 | |
| 4 | 216 | 131 46 48.0 | 46 32.1 | 143.73 | + 0.58 | 0.0062055 | -26.1 | 15 6 27.63 | |
| 5 | 217 | 132 44 17.9 | 44 1.8 | 143.77 | 0.62 | 0.0061416 | 27.1 | 15 2 31.72 | |
| 6 | 218 | 133 41 48.9 | 41 32.6 | 143.81 | 0.63 | 0.0060753 | 28.1 | 14 58 35.81 | |
| 7 | 219 | 134 39 20.9 | 39 4.5 | 143.85 | + 0.61 | 0.0060067 | -27.0 | 14 54 39.90 | |
| 8 | 220 | 135 36 53.7 | 36 37.2 | 143.89 | 0.56 | 0.0059359 | 29.9 | 14 50 43.99 | |
| 9 | 221 | 136 34 27.4 | 34 10.7 | 143.93 | 0.49 | 0.0058630 | 30.8 | 14 46 48.09 | |
| 10 | 222 | 137 32 2.1 | 31 45.2 | 143.96 | + 0.39 | 0.0057879 | -31.7 | 14 42 52.17 | |
| 11 | 223 | 138 29 37.7 | 29 20.7 | 144.00 | 0.27 | 0.0057108 | 32.5 | 14 38 56.26 | |
| 12 | 224 | 139 27 14.3 | 26 57.2 | 144.04 | + 0.14 | 0.0056320 | 33.2 | 14 35 0.35 | |
| 13 | 225 | 140 24 51.8 | 24 34.6 | 144.08 | 0.00 | 0.0055517 | -33.8 | 14 31 4.44 | |
| 14 | 226 | 141 22 30.3 | 22 12.9 | 144.13 | - 0.14 | 0.0054699 | 34.4 | 14 27 8.53 | |
| 15 | 227 | 142 20 9.8 | 19 52.3 | 144.17 | 0.27 | 0.0053868 | 34.9 | 14 23 12.62 | |
| 16 | 228 | 143 17 50.3 | 17 32.7 | 144.21 | - 0.38 | 0.0053024 | -35.4 | 14 19 16.71 | |
| 17 | 229 | 144 15 31.9 | 15 14.2 | 144.26 | 0.47 | 0.0052169 | 35.8 | 14 15 20.80 | |
| 18 | 230 | 145 13 14.8 | 12 57.0 | 144.31 | 0.53 | 0.0051305 | 36.2 | 14 11 24.89 | |
| 19 | 231 | 146 10 59.0 | 10 41.0 | 144.37 | - 0.56 | 0.0050432 | -36.6 | 14 7 28.98 | |
| 20 | 232 | 147 8 44.6 | 8 26.4 | 144.43 | 0.57 | 0.0049549 | 36.9 | 14 3 33.07 | |
| 21 | 233 | 148 6 31.6 | 6 13.3 | 144.49 | 0.55 | 0.0048658 | 37.3 | 13 59 37.16 | |
| 22 | 234 | 149 4 20.1 | 4 1.7 | 144.56 | - 0.49 | 0.0047758 | -37.7 | 13 55 41.25 | |
| 23 | 235 | 150 2 10.3 | 1 51.8 | 144.63 | 0.40 | 0.0046849 | 38.1 | 13 51 45.35 | |
| 24 | 236 | 150 60 2.2 | 59 43.5 | 144.70 | 0.29 | 0.0045931 | 38.5 | 13 47 49.41 | |
| 25 | 237 | 151 57 55.8 | 57 37.0 | 144.77 | - 0.17 | 0.0045003 | -38.9 | 13 43 53.53 | |
| 26 | 238 | 152 55 51.2 | 55 32.3 | 144.85 | - 0.05 | 0.0044063 | 39.4 | 13 39 57.62 | |
| 27 | 239 | 153 53 48.4 | 53 29.4 | 144.92 | + 0.08 | 0.0043110 | 39.9 | 13 36 1.72 | |
| 28 | 240 | 154 51 47.5 | 51 28.4 | 145.00 | + 0.20 | 0.0042144 | -40.5 | 13 32 5.81 | |
| 29 | 241 | 155 49 48.5 | 49 29.2 | 145.08 | 0.31 | 0.0041165 | 41.1 | 13 28 9.90 | |
| 30 | 242 | 156 47 51.4 | 47 32.0 | 145.16 | 0.41 | 0.0040171 | 41.7 | 13 24 13.99 | |
| 31 | 243 | 157 45 56.1 | 45 36.6 | 145.24 | 0.49 | 0.0039160 | 42.5 | 13 20 18.08 | |
| 32 | 244 | 158 44 2.7 | 43 43.1 | 145.31 | + 0.54 | 0.0038131 | -43.3 | 13 16 22.17 | |
| NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^h .0. | | | | | | | | | Diff. for 1 Hour, — 9 ^s .8296. (Table II.) |

| GREENWICH MEAN TIME. | | | | | | | | | |
|----------------------|-----------------|-----------|----------------------|-------------------|-----------|-------------------|---------------------------|-------------------|--------------|
| Day of the Month. | THE MOON'S | | | | | | | | |
| | SEMI- DIAMETER. | | HORIZONTAL PARALLAX. | | | | UPPER TRANSIT. | | AGE. |
| | Noon. | Midnight. | Noon. | Diff. for 1 Hour. | Midnight. | Diff. for 1 Hour. | Meridian of Greenwich. | Diff. for 1 Hour. | Noon. |
| | | | | | | | ^h ^m | ^m | ^d |
| 1 | 15 19.6 | 15 15.5 | 56 8.2 | -1.29 | 55 53.1 | -1.24 | 22 17.8 | 2.24 | 26.3 |
| 2 | 15 11.5 | 15 7.8 | 55 38.7 | 1.18 | 55 25.0 | 1.11 | 23 10.9 | 2.16 | 27.3 |
| 3 | 15 4.3 | 15 1.0 | 55 12.1 | 1.05 | 54 59.9 | 0.98 | 6 | | 28.3 |
| 4 | 14 57.9 | 14 55.1 | 54 48.6 | -0.91 | 54 38.2 | -0.83 | 0 1.3 | 2.04 | 29.3 |
| 5 | 14 52.5 | 14 50.3 | 54 28.9 | 0.74 | 54 20.7 | 0.64 | 0 48.7 | 1.91 | 0.8 |
| 6 | 14 48.4 | 14 46.9 | 54 13.8 | 0.52 | 54 8.2 | 0.41 | 1 33.2 | 1.80 | 1.8 |
| 7 | 14 45.8 | 14 45.1 | 54 4.1 | -0.27 | 54 1.7 | -0.13 | 2 15.1 | 1.71 | 2.8 |
| 8 | 14 45.0 | 14 45.3 | 54 1.1 | +0.03 | 54 2.4 | +0.20 | 2 55.5 | 1.67 | 3.8 |
| 9 | 14 46.2 | 14 47.8 | 54 5.8 | 0.38 | 54 11.4 | 0.56 | 3 35.1 | 1.66 | 4.8 |
| 10 | 14 49.9 | 14 52.7 | 54 19.2 | +0.76 | 54 29.4 | +0.95 | 4 15.0 | 1.69 | 5.8 |
| 11 | 14 56.1 | 15 0.2 | 54 42.0 | 1.16 | 54 57.0 | 1.35 | 4 56.2 | 1.77 | 6.8 |
| 12 | 15 4.9 | 15 10.3 | 55 14.3 | 1.55 | 55 34.0 | 1.74 | 5 40.0 | 1.90 | 7.8 |
| 13 | 15 16.2 | 15 22.7 | 55 55.9 | +1.91 | 56 19.8 | +2.07 | 6 27.4 | 2.06 | 8.8 |
| 14 | 15 29.7 | 15 37.1 | 56 45.4 | 2.20 | 57 12.4 | 2.30 | 7 19.1 | 2.25 | 9.8 |
| 15 | 15 44.7 | 15 52.5 | 57 40.5 | 2.36 | 58 9.1 | 2.39 | 8 15.3 | 2.42 | 10.8 |
| 16 | 16 0.3 | 16 7.9 | 58 37.7 | +2.36 | 59 5.6 | +2.28 | 9 15.2 | 2.53 | 11.8 |
| 17 | 16 15.1 | 16 21.8 | 59 32.2 | 2.14 | 59 56.8 | 1.94 | 10 16.9 | 2.56 | 12.8 |
| 18 | 16 27.8 | 16 32.8 | 60 18.7 | 1.69 | 60 37.3 | 1.40 | 11 18.1 | 2.50 | 13.8 |
| 19 | 16 36.9 | 16 39.7 | 60 52.1 | +1.05 | 61 2.5 | +0.68 | 12 17.0 | 2.39 | 14.8 |
| 20 | 16 41.3 | 16 41.6 | 61 8.3 | +0.30 | 61 9.5 | -0.11 | 13 12.8 | 2.27 | 15.8 |
| 21 | 16 40.6 | 16 38.4 | 61 5.9 | -0.49 | 60 57.8 | 0.85 | 14 6.0 | 2.18 | 16.8 |
| 22 | 16 35.1 | 16 30.9 | 60 45.7 | -1.16 | 60 30.0 | -1.44 | 14 57.3 | 2.13 | 17.8 |
| 23 | 16 25.8 | 16 20.0 | 60 11.3 | 1.67 | 59 50.1 | 1.84 | 15 48.1 | 2.12 | 18.8 |
| 24 | 16 13.8 | 16 7.2 | 59 27.2 | 1.97 | 59 3.0 | 2.05 | 16 39.2 | 2.15 | 19.8 |
| 25 | 16 0.4 | 15 53.6 | 58 38.2 | -2.08 | 58 13.2 | -2.07 | 17 31.4 | 2.20 | 20.8 |
| 26 | 15 46.9 | 15 40.4 | 57 48.6 | 2.03 | 57 24.6 | 1.97 | 18 24.9 | 2.25 | 21.8 |
| 27 | 15 34.1 | 15 28.1 | 57 1.5 | 1.88 | 56 39.5 | 1.78 | 19 19.5 | 2.27 | 22.8 |
| 28 | 15 22.5 | 15 17.2 | 56 18.8 | -1.67 | 55 59.5 | -1.55 | 20 14.0 | 2.24 | 23.8 |
| 29 | 15 12.4 | 15 7.9 | 55 41.7 | 1.43 | 55 25.4 | 1.30 | 21 7.2 | 2.17 | 24.8 |
| 30 | 15 3.9 | 15 0.2 | 55 10.5 | 1.19 | 54 57.0 | 1.07 | 21 58.0 | 2.06 | 25.8 |
| 31 | 14 56.9 | 14 54.0 | 54 45.0 | 0.95 | 54 34.3 | 0.84 | 22 46.0 | 1.94 | 26.8 |
| 32 | 14 51.5 | 14 49.3 | 54 25.0 | -0.73 | 54 16.9 | -0.62 | 23 31.1 | 1.82 | 27.8 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|------------------------|---------------|------------------------|------------|------------------|------------------------|---------------|------------------------|
| SATURDAY 1. | | | | | MONDAY 3. | | | | |
| 0 | 6 8 21.02 | 2.3603 | N.25 51' 32.4 | 2.019 | 0 | 7 59 41.59 | 2.2477 | N.24 45' 37.4 | 4.584 |
| 1 | 6 10 42.63 | 2.3600 | 25 53 28.8 | 1.867 | 1 | 8 1 56.33 | 2.2436 | 24 40 58.6 | 4.707 |
| 2 | 6 13 4.22 | 2.3596 | 25 55 16.4 | 1.729 | 2 | 8 4 10.82 | 2.2394 | 24 36 12.5 | 4.899 |
| 3 | 6 15 25.78 | 2.3591 | 25 56 55.4 | 1.577 | 3 | 8 6 25.05 | 2.2351 | 24 31 19.1 | 4.950 |
| 4 | 6 17 47.31 | 2.3585 | 25 58 25.7 | 1.439 | 4 | 8 8 39.03 | 2.2308 | 24 26 18.5 | 5.071 |
| 5 | 6 20 8.80 | 2.3578 | 25 59 47.3 | 1.287 | 5 | 8 10 52.75 | 2.2266 | 24 21 10.6 | 5.191 |
| 6 | 6 22 30.25 | 2.3571 | 26 1 0.2 | 1.143 | 6 | 8 13 6.22 | 2.2223 | 24 15 55.6 | 5.309 |
| 7 | 6 24 51.65 | 2.3562 | 26 2 4.5 | 0.999 | 7 | 8 15 19.42 | 2.2178 | 24 10 33.5 | 5.427 |
| 8 | 6 27 12.99 | 2.3552 | 26 3 0.1 | 0.855 | 8 | 8 17 32.35 | 2.2133 | 24 5 4.3 | 5.545 |
| 9 | 6 29 34.27 | 2.3549 | 26 3 47.1 | 0.711 | 9 | 8 19 45.02 | 2.2089 | 23 59 28.1 | 5.661 |
| 10 | 6 31 55.49 | 2.3530 | 26 4 25.4 | 0.567 | 10 | 8 21 57.42 | 2.2043 | 23 53 45.0 | 5.776 |
| 11 | 6 34 16.63 | 2.3517 | 26 4 55.1 | 0.423 | 11 | 8 24 9.54 | 2.1997 | 23 47 55.0 | 5.890 |
| 12 | 6 36 37.69 | 2.3504 | 26 5 16.2 | 0.280 | 12 | 8 26 21.38 | 2.1950 | 23 41 58.2 | 6.003 |
| 13 | 6 38 58.67 | 2.3490 | 26 5 28.7 | + 0.137 | 13 | 8 28 32.94 | 2.1904 | 23 35 54.6 | 6.116 |
| 14 | 6 41 19.57 | 2.3475 | 26 5 32.6 | - 0.006 | 14 | 8 30 44.23 | 2.1858 | 23 29 44.2 | 6.228 |
| 15 | 6 43 40.37 | 2.3459 | 26 5 27.9 | 0.149 | 15 | 8 32 55.24 | 2.1819 | 23 23 27.2 | 6.338 |
| 16 | 6 46 1.07 | 2.3449 | 26 5 14.7 | 0.291 | 16 | 8 35 5.97 | 2.1764 | 23 17 3.6 | 6.448 |
| 17 | 6 48 21.67 | 2.3425 | 26 4 53.0 | 0.434 | 17 | 8 37 16.41 | 2.1716 | 23 10 33.4 | 6.556 |
| 18 | 6 50 42.17 | 2.3406 | 26 4 22.7 | 0.576 | 18 | 8 39 26.56 | 2.1668 | 23 3 56.6 | 6.667 |
| 19 | 6 53 2.55 | 2.3386 | 26 3 43.9 | 0.717 | 19 | 8 41 36.42 | 2.1620 | 22 57 13.4 | 6.773 |
| 20 | 6 55 22.80 | 2.3365 | 26 2 56.7 | 0.857 | 20 | 8 43 46.00 | 2.1572 | 22 50 23.8 | 6.879 |
| 21 | 6 57 42.93 | 2.3344 | 26 2 1.1 | 0.997 | 21 | 8 45 55.20 | 2.1524 | 22 43 27.9 | 6.984 |
| 22 | 7 0 2.93 | 2.3329 | 26 0 57.0 | 1.138 | 22 | 8 48 4.29 | 2.1475 | 22 36 25.7 | 7.088 |
| 23 | 7 2 22.80 | 2.3300 | N.25 59 44.5 | 1.278 | 23 | 8 50 12.99 | 2.1426 | N.22 20 17.3 | 7.191 |
| SUNDAY 2. | | | | | TUESDAY 4. | | | | |
| 0 | 7 4 42.53 | 2.3277 | N.25 58 23.6 | 1.417 | 0 | 8 52 21.40 | 2.1377 | N.22 22 2.8 | 7.293 |
| 1 | 7 7 2.12 | 2.3252 | 25 56 54.4 | 1.556 | 1 | 8 54 29.52 | 2.1338 | 22 14 42.2 | 7.394 |
| 2 | 7 9 21.55 | 2.3225 | 25 55 16.9 | 1.694 | 2 | 8 56 37.34 | 2.1299 | 22 7 15.5 | 7.495 |
| 3 | 7 11 40.82 | 2.3198 | 25 53 31.1 | 1.832 | 3 | 8 58 44.87 | 2.1260 | 21 59 42.8 | 7.594 |
| 4 | 7 13 59.93 | 2.3171 | 25 51 37.0 | 1.970 | 4 | 9 0 52.10 | 2.1180 | 21 52 4.2 | 7.693 |
| 5 | 7 16 18.88 | 2.3144 | 25 49 34.7 | 2.107 | 5 | 9 2 59.03 | 2.1131 | 21 44 19.7 | 7.790 |
| 6 | 7 18 37.66 | 2.3116 | 25 47 24.2 | 2.243 | 6 | 9 5 5.67 | 2.1082 | 21 36 29.4 | 7.887 |
| 7 | 7 20 56.27 | 2.3086 | 25 45 5.5 | 2.379 | 7 | 9 7 12.01 | 2.1039 | 21 28 33.3 | 7.983 |
| 8 | 7 23 14.69 | 2.3055 | 25 42 38.7 | 2.514 | 8 | 9 9 18.05 | 2.0989 | 21 20 31.6 | 8.075 |
| 9 | 7 25 32.93 | 2.3024 | 25 40 3.9 | 2.648 | 9 | 9 11 23.80 | 2.0933 | 21 12 24.3 | 8.168 |
| 10 | 7 27 50.98 | 2.2992 | 25 37 21.0 | 2.782 | 10 | 9 13 29.25 | 2.0883 | 21 4 11.4 | 8.261 |
| 11 | 7 30 8.84 | 2.2960 | 25 34 30.1 | 2.915 | 11 | 9 15 34.40 | 2.0834 | 20 55 52.9 | 8.353 |
| 12 | 7 32 26.50 | 2.2927 | 25 31 31.2 | 3.047 | 12 | 9 17 39.26 | 2.0785 | 20 47 29.0 | 8.443 |
| 13 | 7 34 43.96 | 2.2893 | 25 28 24.4 | 3.179 | 13 | 9 19 43.82 | 2.0735 | 20 38 59.7 | 8.533 |
| 14 | 7 37 1.21 | 2.2858 | 25 25 9.7 | 3.311 | 14 | 9 21 48.08 | 2.0685 | 20 30 25.1 | 8.621 |
| 15 | 7 39 18.25 | 2.2823 | 25 21 47.1 | 3.442 | 15 | 9 23 52.04 | 2.0636 | 20 21 45.2 | 8.708 |
| 16 | 7 41 35.08 | 2.2788 | 25 18 16.7 | 3.572 | 16 | 9 25 55.71 | 2.0587 | 20 13 0.1 | 8.795 |
| 17 | 7 43 51.70 | 2.2752 | 25 14 38.5 | 3.701 | 17 | 9 27 59.09 | 2.0538 | 20 4 9.8 | 8.881 |
| 18 | 7 46 8.10 | 2.2714 | 25 10 52.6 | 3.829 | 18 | 9 30 2.17 | 2.0489 | 19 55 14.4 | 8.965 |
| 19 | 7 48 24.27 | 2.2676 | 25 6 59.0 | 3.956 | 19 | 9 32 4.96 | 2.0441 | 19 46 14.0 | 9.048 |
| 20 | 7 50 40.21 | 2.2637 | 25 2 57.8 | 4.083 | 20 | 9 34 7.46 | 2.0392 | 19 37 8.6 | 9.131 |
| 21 | 7 52 55.91 | 2.2598 | 24 58 49.0 | 4.210 | 21 | 9 36 9.66 | 2.0343 | 19 27 58.3 | 9.212 |
| 22 | 7 55 11.38 | 2.2558 | 24 54 32.6 | 4.336 | 22 | 9 38 11.57 | 2.0294 | 19 18 43.1 | 9.292 |
| 23 | 7 57 26.61 | 2.2518 | 24 50 8.7 | 4.460 | 23 | 9 40 13.19 | 2.0246 | 19 9 23.1 | 9.372 |
| 24 | 7 59 41.59 | 2.2477 | N.24 45 37.4 | 4.584 | 24 | 9 42 14.53 | 2.0199 | N.18 59 58.4 | 9.451 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|---|---------------------|------------------|---------------------|-------------|--|---------------------|------------------|---------------------|
| WEDNESDAY 5. | | | | | FRIDAY 7. | | | | |
| 0 | ^h 9 ^m 42 ^s 14.53 | 2.0199 | N. 18° 59' 58.4" | 9.451 | 0 | ^h 11 ^m 14 ^s 16.64 | 1.8313 | N. 10° 13' 31.9" | 12.144 |
| 1 | 9 44 15.58 | 2.0151 | 18 50 29.0 | 9.598 | 1 | 11 16 6.43 | 1.8265 | 10 1 22.2 | 12.179 |
| 2 | 9 46 16.34 | 2.0103 | 18 40 55.0 | 9.605 | 2 | 11 17 56.06 | 1.8257 | 9 49 10.4 | 12.214 |
| 3 | 9 48 16.82 | 2.0056 | 18 31 16.4 | 9.681 | 3 | 11 19 45.52 | 1.8231 | 9 36 56.5 | 12.248 |
| 4 | 9 50 17.01 | 2.0008 | 18 21 33.3 | 9.756 | 4 | 11 21 34.83 | 1.8206 | 9 24 40.6 | 12.281 |
| 5 | 9 52 16.92 | 1.9962 | 18 11 45.7 | 9.830 | 5 | 11 23 23.99 | 1.8180 | 9 12 22.8 | 12.313 |
| 6 | 9 54 16.55 | 1.9915 | 18 1 53.7 | 9.909 | 6 | 11 25 12.99 | 1.8155 | 9 0 3.1 | 12.344 |
| 7 | 9 56 15.90 | 1.9868 | 17 51 57.4 | 9.974 | 7 | 11 27 1.85 | 1.8131 | 8 47 41.5 | 12.375 |
| 8 | 9 58 14.97 | 1.9822 | 17 41 56.8 | 10.045 | 8 | 11 28 50.57 | 1.8107 | 8 35 18.1 | 12.406 |
| 9 | 10 0 13.77 | 1.9777 | 17 31 52.0 | 10.115 | 9 | 11 30 39.14 | 1.8084 | 8 22 52.8 | 12.436 |
| 10 | 10 2 12.30 | 1.9732 | 17 21 43.0 | 10.184 | 10 | 11 32 27.58 | 1.8062 | 8 10 25.8 | 12.464 |
| 11 | 10 4 10.56 | 1.9687 | 17 11 29.9 | 10.252 | 11 | 11 34 15.89 | 1.8041 | 7 57 57.2 | 12.491 |
| 12 | 10 6 8.54 | 1.9642 | 17 1 12.7 | 10.320 | 12 | 11 36 4.07 | 1.8020 | 7 45 26.9 | 12.518 |
| 13 | 10 8 6.26 | 1.9597 | 16 50 51.5 | 10.386 | 13 | 11 37 52.13 | 1.7999 | 7 32 55.0 | 12.544 |
| 14 | 10 10 3.71 | 1.9553 | 16 40 26.4 | 10.450 | 14 | 11 39 40.06 | 1.7978 | 7 20 21.6 | 12.570 |
| 15 | 10 12 0.90 | 1.9509 | 16 29 57.5 | 10.514 | 15 | 11 41 27.87 | 1.7959 | 7 7 46.6 | 12.596 |
| 16 | 10 13 57.82 | 1.9466 | 16 19 24.7 | 10.578 | 16 | 11 43 15.57 | 1.7941 | 6 55 10.1 | 12.620 |
| 17 | 10 15 54.49 | 1.9423 | 16 8 48.1 | 10.641 | 17 | 11 45 3.16 | 1.7923 | 6 42 32.2 | 12.643 |
| 18 | 10 17 50.90 | 1.9381 | 15 58 7.8 | 10.709 | 18 | 11 46 50.64 | 1.7905 | 6 29 53.0 | 12.665 |
| 19 | 10 19 47.06 | 1.9338 | 15 47 23.9 | 10.769 | 19 | 11 48 38.02 | 1.7888 | 6 17 12.4 | 12.687 |
| 20 | 10 21 42.96 | 1.9296 | 15 36 36.3 | 10.829 | 20 | 11 50 25.30 | 1.7873 | 6 4 30.5 | 12.709 |
| 21 | 10 23 38.61 | 1.9254 | 15 25 45.2 | 10.881 | 21 | 11 52 12.48 | 1.7856 | 5 51 47.3 | 12.730 |
| 22 | 10 25 34.01 | 1.9213 | 15 14 50.6 | 10.939 | 22 | 11 53 59.57 | 1.7842 | 5 39 2.9 | 12.750 |
| 23 | 10 27 29.17 | 1.9173 | N. 15° 3' 52.5" | 10.997 | 23 | 11 55 46.58 | 1.7827 | N. 5° 26' 17.3" | 12.769 |
| THURSDAY 6. | | | | | SATURDAY 8. | | | | |
| 0 | 10 29 24.09 | 1.9133 | N. 14° 52' 51.0" | 11.053 | 0 | 11 57 33.50 | 1.7813 | N. 5° 13' 30.6" | 12.788 |
| 1 | 10 31 18.77 | 1.9093 | 14 41 46.2 | 11.108 | 1 | 11 59 20.34 | 1.7800 | 5 0 42.8 | 12.806 |
| 2 | 10 33 13.21 | 1.9053 | 14 30 38.1 | 11.169 | 2 | 12 1 7.10 | 1.7788 | 4 47 53.9 | 12.823 |
| 3 | 10 35 7.41 | 1.9014 | 14 19 26.8 | 11.215 | 3 | 12 2 53.79 | 1.7776 | 4 35 4.0 | 12.839 |
| 4 | 10 37 1.38 | 1.8976 | 14 8 12.3 | 11.268 | 4 | 12 4 40.41 | 1.7765 | 4 22 13.2 | 12.855 |
| 5 | 10 38 55.13 | 1.8939 | 13 56 54.7 | 11.320 | 5 | 12 6 26.97 | 1.7754 | 4 9 21.4 | 12.871 |
| 6 | 10 40 48.65 | 1.8901 | 13 45 33.9 | 11.379 | 6 | 12 8 13.46 | 1.7743 | 3 56 28.7 | 12.886 |
| 7 | 10 42 41.94 | 1.8863 | 13 34 10.1 | 11.421 | 7 | 12 9 59.89 | 1.7734 | 3 43 35.1 | 12.899 |
| 8 | 10 44 35.01 | 1.8827 | 13 22 43.4 | 11.470 | 8 | 12 11 46.27 | 1.7726 | 3 30 40.8 | 12.912 |
| 9 | 10 46 27.87 | 1.8792 | 13 11 13.7 | 11.519 | 9 | 12 13 32.61 | 1.7719 | 3 17 45.7 | 12.924 |
| 10 | 10 48 20.51 | 1.8756 | 12 59 41.1 | 11.566 | 10 | 12 15 18.90 | 1.7712 | 3 4 49.9 | 12.936 |
| 11 | 10 50 12.94 | 1.8721 | 12 48 5.8 | 11.619 | 11 | 12 17 5.15 | 1.7704 | 2 51 53.4 | 12.947 |
| 12 | 10 52 5.16 | 1.8687 | 12 36 27.7 | 11.658 | 12 | 12 18 51.35 | 1.7698 | 2 38 56.2 | 12.958 |
| 13 | 10 53 57.18 | 1.8652 | 12 24 46.8 | 11.703 | 13 | 12 20 37.52 | 1.7693 | 2 25 58.4 | 12.968 |
| 14 | 10 55 48.99 | 1.8618 | 12 13 3.3 | 11.747 | 14 | 12 22 23.66 | 1.7688 | 2 13 0.1 | 12.977 |
| 15 | 10 57 40.60 | 1.8586 | 12 1 17.2 | 11.790 | 15 | 12 24 9.78 | 1.7685 | 2 0 1.2 | 12.986 |
| 16 | 10 59 32.02 | 1.8553 | 11 49 28.5 | 11.833 | 16 | 12 25 55.88 | 1.7682 | 1 47 1.8 | 12.993 |
| 17 | 11 1 23.24 | 1.8521 | 11 37 37.2 | 11.875 | 17 | 12 27 41.96 | 1.7678 | 1 34 2.0 | 13.000 |
| 18 | 11 3 14.27 | 1.8489 | 11 25 43.5 | 11.915 | 18 | 12 29 28.02 | 1.7676 | 1 21 1.8 | 13.007 |
| 19 | 11 5 5.11 | 1.8458 | 11 13 47.4 | 11.955 | 19 | 12 31 14.07 | 1.7675 | 1 8 1.2 | 13.013 |
| 20 | 11 6 55.77 | 1.8428 | 11 1 48.9 | 11.995 | 20 | 12 33 0.12 | 1.7675 | 0 55 0.3 | 13.018 |
| 21 | 11 8 46.25 | 1.8398 | 10 49 48.0 | 12.034 | 21 | 12 34 46.17 | 1.7675 | 0 41 59.0 | 13.023 |
| 22 | 11 10 36.55 | 1.8369 | 10 37 44.8 | 12.079 | 22 | 12 36 32.22 | 1.7675 | 0 28 57.5 | 13.027 |
| 23 | 11 12 26.68 | 1.8341 | 10 25 39.4 | 12.108 | 23 | 12 38 18.27 | 1.7676 | 0 15 55.8 | 13.030 |
| 24 | 11 14 16.64 | 1.8313 | N. 10° 13' 31.9" | 12.144 | 24 | 12 40 4.33 | 1.7678 | N. 0° 2' 53.9" | 13.033 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|------------|------------------|---------------------|--------------|---------------------|---------------|------------------|---------------------|---------------|---------------------|
| SUNDAY 9. | | | | | TUESDAY 11. | | | | |
| 0 | 12 40 4.33 | 1.7678 | N. 0 2 53.9 | 13.033 | 0 | 14 6 29.22 | 1.8600 | S. 10 13 4.6 | 12.366 |
| 1 | 12 41 50.40 | 1.7681 | S. 0 10 8.2 | 13.035 | 1 | 14 8 20.93 | 1.8637 | 10 25 25.6 | 12.334 |
| 2 | 12 43 36.50 | 1.7685 | 0 23 10.3 | 13.036 | 2 | 14 10 12.86 | 1.8674 | 10 37 44.7 | 12.309 |
| 3 | 12 45 22.62 | 1.7689 | 0 36 12.5 | 13.037 | 3 | 14 12 5.01 | 1.8712 | 10 50 1.8 | 12.268 |
| 4 | 12 47 8.77 | 1.7694 | 0 49 14.7 | 13.037 | 4 | 14 13 57.40 | 1.8751 | 11 2 16.9 | 12.234 |
| 5 | 12 48 54.95 | 1.7699 | 1 2 16.9 | 13.036 | 5 | 14 15 50.02 | 1.8790 | 11 14 29.9 | 12.199 |
| 6 | 12 50 41.16 | 1.7705 | 1 15 19.0 | 13.035 | 6 | 14 17 42.88 | 1.8830 | 11 26 40.8 | 12.163 |
| 7 | 12 52 27.41 | 1.7712 | 1 28 21.1 | 13.033 | 7 | 14 19 35.98 | 1.8871 | 11 38 49.5 | 12.127 |
| 8 | 12 54 13.71 | 1.7720 | 1 41 23.0 | 13.030 | 8 | 14 21 29.33 | 1.8913 | 11 50 56.0 | 12.089 |
| 9 | 12 56 0.05 | 1.7728 | 1 54 24.7 | 13.027 | 9 | 14 23 22.94 | 1.8956 | 12 3 0.2 | 12.050 |
| 10 | 12 57 46.44 | 1.7737 | 2 7 26.2 | 13.023 | 10 | 14 25 16.80 | 1.8999 | 12 15 2.0 | 12.011 |
| 11 | 12 59 32.89 | 1.7747 | 2 20 27.4 | 13.018 | 11 | 14 27 10.92 | 1.9042 | 12 27 1.5 | 11.972 |
| 12 | 13 1 19.40 | 1.7757 | 2 33 28.4 | 13.013 | 12 | 14 29 5.31 | 1.9087 | 12 38 58.6 | 11.931 |
| 13 | 13 3 5.98 | 1.7768 | 2 46 29.0 | 13.007 | 13 | 14 30 59.97 | 1.9132 | 12 50 53.2 | 11.888 |
| 14 | 13 4 52.62 | 1.7779 | 2 59 29.2 | 13.001 | 14 | 14 32 54.90 | 1.9177 | 13 2 45.2 | 11.845 |
| 15 | 13 6 39.33 | 1.7792 | 3 12 29.1 | 12.994 | 15 | 14 34 50.10 | 1.9223 | 13 14 34.6 | 11.802 |
| 16 | 13 8 26.12 | 1.7805 | 3 25 28.5 | 12.986 | 16 | 14 36 45.58 | 1.9271 | 13 26 21.4 | 11.757 |
| 17 | 13 10 12.99 | 1.7818 | 3 38 27.4 | 12.977 | 17 | 14 38 41.35 | 1.9319 | 13 38 5.5 | 11.712 |
| 18 | 13 11 59.94 | 1.7832 | 3 51 25.8 | 12.968 | 18 | 14 40 37.41 | 1.9367 | 13 49 46.8 | 11.665 |
| 19 | 13 13 46.98 | 1.7846 | 4 4 23.6 | 12.958 | 19 | 14 42 33.76 | 1.9417 | 14 1 25.3 | 11.617 |
| 20 | 13 15 34.12 | 1.7865 | 4 17 20.8 | 12.948 | 20 | 14 44 30.41 | 1.9467 | 14 13 0.9 | 11.569 |
| 21 | 13 17 21.36 | 1.7882 | 4 30 17.4 | 12.937 | 21 | 14 46 27.36 | 1.9518 | 14 24 33.6 | 11.520 |
| 22 | 13 19 8.70 | 1.7899 | 4 43 13.3 | 12.925 | 22 | 14 48 24.62 | 1.9569 | 14 36 3.3 | 11.470 |
| 23 | 13 20 56.14 | 1.7916 | S. 4 56 8.4 | 12.912 | 23 | 14 50 22.19 | 1.9621 | S. 14 47 30.0 | 11.419 |
| MONDAY 10. | | | | | WEDNESDAY 12. | | | | |
| 0 | 13 22 43.69 | 1.7934 | S. 5 9 2.7 | 12.898 | 0 | 14 52 20.07 | 1.9673 | S. 14 58 53.6 | 11.367 |
| 1 | 13 24 31.35 | 1.7954 | 5 21 56.2 | 12.885 | 1 | 14 54 18.27 | 1.9727 | 15 10 14.0 | 11.313 |
| 2 | 13 26 19.14 | 1.7975 | 5 34 48.9 | 12.871 | 2 | 14 56 16.79 | 1.9781 | 15 21 31.2 | 11.259 |
| 3 | 13 28 7.05 | 1.7996 | 5 47 40.7 | 12.855 | 3 | 14 58 15.64 | 1.9835 | 15 32 45.1 | 11.203 |
| 4 | 13 29 55.09 | 1.8017 | 6 0 31.5 | 12.839 | 4 | 15 0 14.81 | 1.9890 | 15 43 55.6 | 11.147 |
| 5 | 13 31 43.26 | 1.8039 | 6 13 21.3 | 12.823 | 5 | 15 2 14.32 | 1.9946 | 15 55 2.7 | 11.090 |
| 6 | 13 33 31.56 | 1.8062 | 6 26 10.2 | 12.806 | 6 | 15 4 14.16 | 2.0002 | 16 6 6.4 | 11.032 |
| 7 | 13 35 20.00 | 1.8086 | 6 38 58.0 | 12.787 | 7 | 15 6 14.34 | 2.0059 | 16 17 6.5 | 10.979 |
| 8 | 13 37 8.59 | 1.8111 | 6 51 44.6 | 12.767 | 8 | 15 8 14.87 | 2.0117 | 16 28 3.0 | 10.919 |
| 9 | 13 38 57.33 | 1.8137 | 7 4 30.1 | 12.748 | 9 | 15 10 15.74 | 2.0175 | 16 38 55.9 | 10.851 |
| 10 | 13 40 46.23 | 1.8162 | 7 17 14.4 | 12.728 | 10 | 15 12 16.97 | 2.0234 | 16 49 45.1 | 10.788 |
| 11 | 13 42 35.28 | 1.8188 | 7 29 57.5 | 12.707 | 11 | 15 14 18.55 | 2.0293 | 17 0 30.4 | 10.723 |
| 12 | 13 44 24.49 | 1.8216 | 7 42 39.3 | 12.686 | 12 | 15 16 20.49 | 2.0353 | 17 11 11.8 | 10.656 |
| 13 | 13 46 13.87 | 1.8244 | 7 55 19.8 | 12.663 | 13 | 15 18 22.79 | 2.0414 | 17 21 49.3 | 10.593 |
| 14 | 13 48 3.42 | 1.8272 | 8 7 58.9 | 12.640 | 14 | 15 20 25.46 | 2.0475 | 17 32 22.9 | 10.526 |
| 15 | 13 49 53.14 | 1.8302 | 8 20 36.6 | 12.616 | 15 | 15 22 28.49 | 2.0537 | 17 42 52.4 | 10.457 |
| 16 | 13 51 43.04 | 1.8332 | 8 33 12.8 | 12.591 | 16 | 15 24 31.90 | 2.0599 | 17 53 17.8 | 10.388 |
| 17 | 13 53 33.13 | 1.8363 | 8 45 47.5 | 12.566 | 17 | 15 26 35.68 | 2.0662 | 18 3 39.0 | 10.317 |
| 18 | 13 55 23.40 | 1.8395 | 8 58 20.7 | 12.540 | 18 | 15 28 39.84 | 2.0725 | 18 13 55.9 | 10.246 |
| 19 | 13 57 13.87 | 1.8427 | 9 10 52.3 | 12.513 | 19 | 15 30 44.38 | 2.0789 | 18 24 8.5 | 10.173 |
| 20 | 13 59 4.53 | 1.8460 | 9 23 22.2 | 12.485 | 20 | 15 32 49.31 | 2.0853 | 18 34 16.7 | 10.098 |
| 21 | 14 0 55.39 | 1.8493 | 9 35 50.5 | 12.457 | 21 | 15 34 54.62 | 2.0917 | 18 44 20.3 | 10.023 |
| 22 | 14 2 46.45 | 1.8528 | 9 48 17.0 | 12.427 | 22 | 15 37 0.32 | 2.0983 | 18 54 19.4 | 9.947 |
| 23 | 14 4 37.73 | 1.8564 | 10 0 41.7 | 12.397 | 23 | 15 39 6.42 | 2.1050 | 19 4 13.9 | 9.870 |
| 24 | 14 6 29.22 | 1.8600 | S. 10 13 4.6 | 12.366 | 24 | 15 41 12.92 | 2.1116 | S. 19 14 3.8 | 9.792 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|--|---------------------|------------------|---------------------|--------------|--|---------------------|------------------|---------------------|
| THURSDAY 13. | | | | | SATURDAY 15. | | | | |
| 0 | ^h 15 ^m 41 ^s 12.92 | 2.1116 | S. 19° 14' 3.8" | 9.799 | 0 | ^h 17 ^m 30 ^s 39.36 | 2.4477 | S. 25° 8' 8.7" | 4.434 |
| 1 | 15 43 19.81 | 2.1189 | 19 23 48.9 | 9.711 | 1 | 17 33 6.42 | 2.4549 | 25 12 30.4 | 4.989 |
| 2 | 15 45 27.10 | 2.1249 | 19 33 29.1 | 9.699 | 2 | 17 35 33.86 | 2.4605 | 25 16 43.4 | 4.143 |
| 3 | 15 47 34.80 | 2.1317 | 19 43 4.4 | 9.547 | 3 | 17 38 1.68 | 2.4668 | 25 20 47.6 | 3.995 |
| 4 | 15 49 42.91 | 2.1385 | 19 52 34.7 | 9.463 | 4 | 17 40 29.88 | 2.4731 | 25 24 42.8 | 3.845 |
| 5 | 15 51 51.42 | 2.1453 | 20 1 59.9 | 9.378 | 5 | 17 42 58.45 | 2.4799 | 25 28 29.0 | 3.696 |
| 6 | 15 54 0.34 | 2.1529 | 20 11 20.0 | 9.292 | 6 | 17 45 27.39 | 2.4853 | 25 32 6.2 | 3.543 |
| 7 | 15 56 9.68 | 2.1591 | 20 20 34.9 | 9.204 | 7 | 17 47 56.69 | 2.4913 | 25 35 34.2 | 3.390 |
| 8 | 15 58 19.43 | 2.1660 | 20 29 44.5 | 9.114 | 8 | 17 50 26.35 | 2.4971 | 25 38 53.0 | 3.237 |
| 9 | 16 0 29.60 | 2.1729 | 20 38 48.6 | 9.023 | 9 | 17 52 56.35 | 2.5029 | 25 42 2.6 | 3.082 |
| 10 | 16 2 40.18 | 2.1799 | 20 47 47.3 | 8.932 | 10 | 17 55 26.70 | 2.5087 | 25 45 2.8 | 2.924 |
| 11 | 16 4 51.19 | 2.1870 | 20 56 40.5 | 8.840 | 11 | 17 57 57.40 | 2.5144 | 25 47 53.5 | 2.768 |
| 12 | 16 7 2.62 | 2.1940 | 21 5 28.1 | 8.746 | 12 | 18 0 28.43 | 2.5199 | 25 50 34.7 | 2.607 |
| 13 | 16 9 14.47 | 2.2011 | 21 14 10.0 | 8.650 | 13 | 18 2 59.79 | 2.5253 | 25 53 6.3 | 2.447 |
| 14 | 16 11 26.75 | 2.2082 | 21 22 46.1 | 8.553 | 14 | 18 5 31.47 | 2.5307 | 25 55 28.3 | 2.286 |
| 15 | 16 13 39.46 | 2.2154 | 21 31 16.4 | 8.456 | 15 | 18 8 3.47 | 2.5359 | 25 57 40.6 | 2.123 |
| 16 | 16 15 52.60 | 2.2225 | 21 39 40.8 | 8.356 | 16 | 18 10 35.78 | 2.5411 | 25 59 43.1 | 1.960 |
| 17 | 16 18 6.16 | 2.2296 | 21 47 59.1 | 8.254 | 17 | 18 13 8.40 | 2.5461 | 26 1 35.8 | 1.796 |
| 18 | 16 20 20.15 | 2.2368 | 21 56 11.3 | 8.152 | 18 | 18 15 41.31 | 2.5509 | 26 3 18.6 | 1.630 |
| 19 | 16 22 34.57 | 2.2440 | 22 4 17.4 | 8.049 | 19 | 18 18 14.51 | 2.5557 | 26 4 51.4 | 1.463 |
| 20 | 16 24 49.43 | 2.2512 | 22 12 17.2 | 7.943 | 20 | 18 20 48.00 | 2.5604 | 26 6 14.2 | 1.296 |
| 21 | 16 27 4.72 | 2.2584 | 22 20 10.6 | 7.837 | 21 | 18 23 21.76 | 2.5649 | 26 7 27.0 | 1.128 |
| 22 | 16 29 20.44 | 2.2656 | 22 27 57.6 | 7.729 | 22 | 18 25 55.79 | 2.5693 | 26 8 29.6 | 0.958 |
| 23 | 16 31 36.59 | 2.2728 | S. 22° 35' 38.1" | 7.620 | 23 | 18 28 30.08 | 2.5737 | S. 26° 9' 22.0" | 0.787 |
| FRIDAY 14. | | | | | SUNDAY 16. | | | | |
| 0 | 16 33 53.18 | 2.2801 | S. 22° 43' 12.0" | 7.509 | 0 | 18 31 4.63 | 2.5778 | S. 26° 10' 4.1" | 0.616 |
| 1 | 16 36 10.20 | 2.2873 | 22 50 39.2 | 7.397 | 1 | 18 33 39.42 | 2.5818 | 26 10 35.9 | 0.444 |
| 2 | 16 38 27.66 | 2.2946 | 22 57 59.7 | 7.284 | 2 | 18 36 14.45 | 2.5857 | 26 10 57.4 | 0.272 |
| 3 | 16 40 45.55 | 2.3018 | 23 5 13.3 | 7.169 | 3 | 18 38 49.71 | 2.5895 | 26 11 8.6 | - 0.099 |
| 4 | 16 43 3.87 | 2.3089 | 23 12 20.0 | 7.053 | 4 | 18 41 25.19 | 2.5932 | 26 11 9.3 | + 0.076 |
| 5 | 16 45 22.62 | 2.3161 | 23 19 19.7 | 6.936 | 5 | 18 44 0.89 | 2.5967 | 26 10 59.5 | 0.251 |
| 6 | 16 47 41.81 | 2.3233 | 23 26 12.3 | 6.817 | 6 | 18 46 36.80 | 2.6001 | 26 10 39.2 | 0.427 |
| 7 | 16 50 1.42 | 2.3305 | 23 32 57.7 | 6.696 | 7 | 18 49 12.90 | 2.6039 | 26 10 8.3 | 0.603 |
| 8 | 16 52 21.47 | 2.3377 | 23 39 35.8 | 6.574 | 8 | 18 51 49.19 | 2.6083 | 26 9 26.8 | 0.780 |
| 9 | 16 54 41.95 | 2.3449 | 23 46 6.6 | 6.452 | 9 | 18 54 25.66 | 2.6099 | 26 8 34.7 | 0.957 |
| 10 | 16 57 2.86 | 2.3520 | 23 52 30.0 | 6.327 | 10 | 18 57 2.30 | 2.6121 | 26 7 31.9 | 1.136 |
| 11 | 16 59 24.19 | 2.3591 | 23 58 45.8 | 6.200 | 11 | 18 59 39.11 | 2.6147 | 26 6 18.4 | 1.315 |
| 12 | 17 1 45.95 | 2.3662 | 24 4 54.0 | 6.072 | 12 | 19 2 16.07 | 2.6172 | 26 4 54.1 | 1.494 |
| 13 | 17 4 8.13 | 2.3733 | 24 10 54.5 | 5.943 | 13 | 19 4 53.18 | 2.6197 | 26 3 19.1 | 1.673 |
| 14 | 17 6 30.73 | 2.3809 | 24 16 47.2 | 5.813 | 14 | 19 7 30.43 | 2.6218 | 26 1 33.3 | 1.853 |
| 15 | 17 8 53.75 | 2.3879 | 24 22 32.1 | 5.682 | 15 | 19 10 7.80 | 2.6238 | 25 59 36.7 | 2.033 |
| 16 | 17 11 17.19 | 2.3941 | 24 28 9.1 | 5.549 | 16 | 19 12 45.29 | 2.6257 | 25 57 29.3 | 2.214 |
| 17 | 17 13 41.04 | 2.4009 | 24 33 38.0 | 5.414 | 17 | 19 15 22.89 | 2.6276 | 25 55 11.0 | 2.396 |
| 18 | 17 16 5.30 | 2.4078 | 24 38 58.8 | 5.278 | 18 | 19 18 0.60 | 2.6299 | 25 52 41.8 | 2.577 |
| 19 | 17 18 29.97 | 2.4146 | 24 44 11.4 | 5.141 | 19 | 19 20 38.40 | 2.6307 | 25 50 1.7 | 2.758 |
| 20 | 17 20 55.05 | 2.4213 | 24 49 15.7 | 5.009 | 20 | 19 23 16.28 | 2.6320 | 25 47 10.8 | 2.939 |
| 21 | 17 23 20.53 | 2.4280 | 24 54 11.7 | 4.863 | 21 | 19 25 54.24 | 2.6332 | 25 44 9.0 | 3.122 |
| 22 | 17 25 46.41 | 2.4347 | 24 58 59.3 | 4.722 | 22 | 19 28 32.27 | 2.6342 | 25 40 56.2 | 3.304 |
| 23 | 17 28 12.69 | 2.4412 | 25 3 38.3 | 4.578 | 23 | 19 31 10.35 | 2.6351 | 25 37 32.5 | 3.486 |
| 24 | 17 30 39.36 | 2.4477 | S. 25° 8' 8.7" | 4.434 | 24 | 19 33 48.48 | 2.6358 | S. 25° 33' 57.9" | 3.667 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|---------------------|---------------|---------------------|---------------|------------------|---------------------|---------------|---------------------|
| MONDAY 17. | | | | | WEDNESDAY 19. | | | | |
| 0 | 19 33 48.48 | 2.6358 | S. 25 33 57.9 | 3.667 | 0 | 21 38 35.22 | 2.5319 | S. 19 17 28.5 | 11.653 |
| 1 | 19 36 26.65 | 2.6364 | 25 30 12.4 | 3.849 | 1 | 21 41 6.36 | 2.5167 | 19 5 45.2 | 11.789 |
| 2 | 19 39 4.85 | 2.6367 | 25 26 16.0 | 4.032 | 2 | 21 43 37.23 | 2.5129 | 18 53 53.8 | 11.933 |
| 3 | 19 41 43.06 | 2.6369 | 25 22 8.6 | 4.214 | 3 | 21 46 7.83 | 2.5077 | 18 41 54.4 | 12.056 |
| 4 | 19 44 21.28 | 2.6371 | 25 17 50.3 | 4.395 | 4 | 21 48 38.15 | 2.5030 | 18 29 47.1 | 12.187 |
| 5 | 19 46 59.51 | 2.6373 | 25 13 21.2 | 4.576 | 5 | 21 51 8.19 | 2.4984 | 18 17 32.0 | 12.317 |
| 6 | 19 49 37.74 | 2.6370 | 25 8 41.2 | 4.757 | 6 | 21 53 37.95 | 2.4937 | 18 5 9.1 | 12.444 |
| 7 | 19 52 15.95 | 2.6366 | 25 3 50.3 | 4.938 | 7 | 21 56 7.43 | 2.4889 | 17 52 38.7 | 12.569 |
| 8 | 19 54 54.13 | 2.6361 | 24 58 48.6 | 5.119 | 8 | 21 58 36.62 | 2.4842 | 17 40 0.8 | 12.693 |
| 9 | 19 57 32.28 | 2.6355 | 24 53 36.0 | 5.300 | 9 | 22 1 5.53 | 2.4794 | 17 27 15.5 | 12.816 |
| 10 | 20 0 10.39 | 2.6347 | 24 48 12.6 | 5.480 | 10 | 22 3 34.15 | 2.4746 | 17 14 22.9 | 12.936 |
| 11 | 20 2 48.45 | 2.6339 | 24 42 38.4 | 5.659 | 11 | 22 6 2.48 | 2.4698 | 17 1 23.2 | 13.053 |
| 12 | 20 5 26.46 | 2.6329 | 24 36 53.5 | 5.838 | 12 | 22 8 30.53 | 2.4651 | 16 48 16.5 | 13.170 |
| 13 | 20 8 4.40 | 2.6317 | 24 30 57.9 | 6.017 | 13 | 22 10 58.29 | 2.4603 | 16 35 2.8 | 13.284 |
| 14 | 20 10 42.26 | 2.6303 | 24 24 51.5 | 6.196 | 14 | 22 13 25.76 | 2.4554 | 16 21 42.4 | 13.396 |
| 15 | 20 13 20.04 | 2.6289 | 24 18 34.4 | 6.373 | 15 | 22 15 52.94 | 2.4506 | 16 8 15.3 | 13.507 |
| 16 | 20 15 57.73 | 2.6273 | 24 12 6.7 | 6.549 | 16 | 22 18 19.83 | 2.4457 | 15 54 41.6 | 13.616 |
| 17 | 20 18 35.32 | 2.6256 | 24 5 28.5 | 6.725 | 17 | 22 20 46.43 | 2.4409 | 15 41 1.4 | 13.723 |
| 18 | 20 21 12.80 | 2.6237 | 23 58 39.7 | 6.901 | 18 | 22 23 12.74 | 2.4361 | 15 27 14.9 | 13.828 |
| 19 | 20 23 50.17 | 2.6218 | 23 51 40.4 | 7.075 | 19 | 22 25 38.76 | 2.4313 | 15 13 22.1 | 13.930 |
| 20 | 20 26 27.42 | 2.6198 | 23 44 30.7 | 7.249 | 20 | 22 28 4.50 | 2.4266 | 14 59 23.3 | 14.030 |
| 21 | 20 29 4.54 | 2.6176 | 23 37 10.5 | 7.423 | 21 | 22 30 29.95 | 2.4218 | 14 45 18.5 | 14.129 |
| 22 | 20 31 41.53 | 2.6152 | 23 29 39.9 | 7.595 | 22 | 22 32 55.11 | 2.4170 | 14 31 7.8 | 14.226 |
| 23 | 20 34 18.37 | 2.6127 | S. 23 21 59.1 | 7.765 | 23 | 22 35 19.99 | 2.4122 | S. 14 16 51.4 | 14.320 |
| TUESDAY 18. | | | | | THURSDAY 20. | | | | |
| 0 | 20 36 55.06 | 2.6103 | S. 23 14 8.1 | 7.935 | 0 | 22 37 44.58 | 2.4075 | S. 14 2 29.4 | 14.412 |
| 1 | 20 39 31.60 | 2.6076 | 23 6 6.9 | 8.105 | 1 | 22 40 8.89 | 2.4028 | 13 48 1.9 | 14.503 |
| 2 | 20 42 7.97 | 2.6048 | 22 57 55.5 | 8.274 | 2 | 22 42 32.92 | 2.3981 | 13 33 29.0 | 14.592 |
| 3 | 20 44 44.17 | 2.6018 | 22 49 34.0 | 8.442 | 3 | 22 44 56.66 | 2.3934 | 13 18 50.8 | 14.679 |
| 4 | 20 47 20.19 | 2.5988 | 22 41 2.5 | 8.608 | 4 | 22 47 20.12 | 2.3888 | 13 4 7.5 | 14.763 |
| 5 | 20 49 56.03 | 2.5957 | 22 32 21.1 | 8.773 | 5 | 22 49 43.31 | 2.3842 | 12 49 19.2 | 14.846 |
| 6 | 20 52 31.68 | 2.5925 | 22 23 29.8 | 8.937 | 6 | 22 52 6.22 | 2.3796 | 12 34 25.9 | 14.927 |
| 7 | 20 55 7.13 | 2.5892 | 22 14 28.7 | 9.099 | 7 | 22 54 28.86 | 2.3751 | 12 19 27.9 | 15.005 |
| 8 | 20 57 42.39 | 2.5859 | 22 5 17.9 | 9.261 | 8 | 22 56 51.23 | 2.3705 | 12 4 25.3 | 15.089 |
| 9 | 21 0 17.44 | 2.5824 | 21 55 57.4 | 9.421 | 9 | 22 59 13.32 | 2.3660 | 11 49 18.1 | 15.157 |
| 10 | 21 2 52.28 | 2.5788 | 21 46 27.4 | 9.579 | 10 | 23 1 35.15 | 2.3616 | 11 34 6.5 | 15.229 |
| 11 | 21 5 26.90 | 2.5752 | 21 36 47.9 | 9.737 | 11 | 23 3 56.71 | 2.3572 | 11 18 50.6 | 15.299 |
| 12 | 21 8 1.30 | 2.5714 | 21 26 58.9 | 9.894 | 12 | 23 6 18.01 | 2.3528 | 11 3 30.6 | 15.367 |
| 13 | 21 10 35.47 | 2.5676 | 21 17 0.6 | 10.048 | 13 | 23 8 39.05 | 2.3485 | 10 48 6.5 | 15.433 |
| 14 | 21 13 9.41 | 2.5637 | 21 6 53.1 | 10.202 | 14 | 23 10 59.83 | 2.3443 | 10 32 38.6 | 15.497 |
| 15 | 21 15 43.12 | 2.5598 | 20 56 36.4 | 10.354 | 15 | 23 13 20.36 | 2.3401 | 10 17 6.9 | 15.559 |
| 16 | 21 18 16.59 | 2.5557 | 20 46 10.6 | 10.505 | 16 | 23 15 40.64 | 2.3359 | 10 1 31.5 | 15.619 |
| 17 | 21 20 49.81 | 2.5516 | 20 35 35.8 | 10.654 | 17 | 23 18 0.67 | 2.3317 | 9 45 52.6 | 15.678 |
| 18 | 21 23 22.78 | 2.5474 | 20 24 52.1 | 10.803 | 18 | 23 20 20.45 | 2.3277 | 9 30 10.2 | 15.734 |
| 19 | 21 25 55.50 | 2.5432 | 20 13 59.6 | 10.948 | 19 | 23 22 39.99 | 2.3237 | 9 14 24.5 | 15.787 |
| 20 | 21 28 27.97 | 2.5390 | 20 2 58.4 | 11.092 | 20 | 23 24 59.29 | 2.3197 | 8 58 35.7 | 15.839 |
| 21 | 21 31 0.18 | 2.5347 | 19 51 48.6 | 11.234 | 21 | 23 27 18.35 | 2.3157 | 8 42 43.8 | 15.889 |
| 22 | 21 33 32.13 | 2.5302 | 19 40 30.3 | 11.375 | 22 | 23 29 37.17 | 2.3118 | 8 26 49.0 | 15.937 |
| 23 | 21 36 3.81 | 2.5257 | 19 29 3.6 | 11.515 | 23 | 23 31 55.77 | 2.3081 | 8 10 51.4 | 15.983 |
| 24 | 21 38 35.22 | 2.5212 | S. 19 17 28.5 | 11.653 | 24 | 23 34 14.14 | 2.3044 | S. 7 54 51.1 | 16.027 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|--|---------------------|-----------------|---------------------|------------|---|---------------------|----------------|---------------------|
| FRIDAY 21. | | | | | SUNDAY 23. | | | | |
| 0 | ^h 23 ^m 34 ^s 14.14 | 2.3044 | S. 7° 54' 51.1" | 16.097 | 0 | ^h 1 ^m 21 ^s 47.39 | 2.3044 | N. 5° 8' 12.5" | 15.908 |
| 1 | 23 36 32.29 | 2.3007 | 7 38 48.2 | 16.088 | 1 | 1 23 59.64 | 2.3041 | 5 24 5.7 | 15.889 |
| 2 | 23 38 50.22 | 2.2970 | 7 22 42.9 | 16.107 | 2 | 1 26 11.88 | 2.3038 | 5 39 56.0 | 15.814 |
| 3 | 23 41 7.93 | 2.2934 | 7 6 35.3 | 16.145 | 3 | 1 28 24.10 | 2.3036 | 5 55 43.4 | 15.768 |
| 4 | 23 43 25.43 | 2.2899 | 6 50 25.5 | 16.181 | 4 | 1 30 36.31 | 2.3035 | 6 11 27.9 | 15.717 |
| 5 | 23 45 42.72 | 2.2865 | 6 34 13.6 | 16.215 | 5 | 1 32 48.52 | 2.3034 | 6 27 9.5 | 15.667 |
| 6 | 23 47 59.81 | 2.2833 | 6 17 59.7 | 16.247 | 6 | 1 35 0.72 | 2.3034 | 6 42 48.0 | 15.615 |
| 7 | 23 50 16.70 | 2.2798 | 6 1 44.0 | 16.278 | 7 | 1 37 12.93 | 2.3036 | 6 58 23.3 | 15.561 |
| 8 | 23 52 33.99 | 2.2765 | 5 45 26.6 | 16.304 | 8 | 1 39 25.15 | 2.3037 | 7 13 55.3 | 15.506 |
| 9 | 23 54 49.88 | 2.2732 | 5 29 7.5 | 16.330 | 9 | 1 41 37.37 | 2.3039 | 7 29 24.0 | 15.449 |
| 10 | 23 57 6.18 | 2.2709 | 5 12 47.0 | 16.353 | 10 | 1 43 49.61 | 2.3042 | 7 44 49.2 | 15.391 |
| 11 | 23 59 22.30 | 2.2679 | 4 56 25.1 | 16.376 | 11 | 1 46 1.87 | 2.3044 | 8 0 10.9 | 15.332 |
| 12 | 0 1 38.24 | 2.2649 | 4 40 1.9 | 16.396 | 12 | 1 48 14.14 | 2.3047 | 8 15 29.0 | 15.271 |
| 13 | 0 3 54.00 | 2.2613 | 4 23 37.6 | 16.413 | 13 | 1 50 26.44 | 2.3052 | 8 30 43.4 | 15.208 |
| 14 | 0 6 9.59 | 2.2584 | 4 7 12.3 | 16.429 | 14 | 1 52 38.77 | 2.3058 | 8 45 54.0 | 15.144 |
| 15 | 0 8 25.01 | 2.2556 | 3 50 46.1 | 16.444 | 15 | 1 54 51.14 | 2.3064 | 9 1 0.7 | 15.079 |
| 16 | 0 10 40.26 | 2.2529 | 3 34 19.0 | 16.457 | 16 | 1 57 3.54 | 2.3070 | 9 16 3.5 | 15.012 |
| 17 | 0 12 55.36 | 2.2503 | 3 17 51.3 | 16.467 | 17 | 1 59 15.98 | 2.3077 | 9 31 2.2 | 14.944 |
| 18 | 0 15 10.30 | 2.2477 | 3 1 23.0 | 16.476 | 18 | 2 1 28.47 | 2.3085 | 9 45 56.8 | 14.875 |
| 19 | 0 17 25.09 | 2.2452 | 2 44 54.2 | 16.482 | 19 | 2 3 41.00 | 2.3093 | 10 0 47.2 | 14.804 |
| 20 | 0 19 39.73 | 2.2427 | 2 28 25.1 | 16.487 | 20 | 2 5 53.58 | 2.3109 | 10 15 33.3 | 14.732 |
| 21 | 0 21 54.22 | 2.2404 | 2 11 55.8 | 16.489 | 21 | 2 8 6.22 | 2.3111 | 10 30 15.1 | 14.660 |
| 22 | 0 24 8.58 | 2.2389 | 1 55 26.4 | 16.490 | 22 | 2 10 18.91 | 2.3121 | 10 44 52.5 | 14.585 |
| 23 | 0 26 22.80 | 2.2359 | S. 1 38 57.0 | 16.490 | 23 | 2 12 31.67 | 2.3131 | N. 10 59 25.3 | 14.508 |
| SATURDAY 22. | | | | | MONDAY 24. | | | | |
| 0 | 0 28 36.89 | 2.2337 | S. 1 22 27.6 | 16.488 | 0 | 2 14 44.49 | 2.3142 | N. 11 13 53.5 | 14.431 |
| 1 | 0 30 50.85 | 2.2317 | 1 5 58.5 | 16.483 | 1 | 2 16 57.37 | 2.3154 | 11 28 17.0 | 14.358 |
| 2 | 0 33 4.70 | 2.2298 | 0 49 29.7 | 16.477 | 2 | 2 19 10.33 | 2.3166 | 11 42 35.8 | 14.273 |
| 3 | 0 35 18.43 | 2.2278 | 0 33 1.3 | 16.469 | 3 | 2 21 23.36 | 2.3178 | 11 56 49.8 | 14.192 |
| 4 | 0 37 32.04 | 2.2260 | 0 16 33.4 | 16.459 | 4 | 2 23 36.46 | 2.3190 | 12 10 58.9 | 14.110 |
| 5 | 0 39 45.55 | 2.2243 | S. 0 0 6.2 | 16.447 | 5 | 2 25 49.64 | 2.3204 | 12 25 3.0 | 14.026 |
| 6 | 0 41 58.95 | 2.2225 | N. 0 16 20.3 | 16.434 | 6 | 2 28 2.91 | 2.3218 | 12 39 2.0 | 13.941 |
| 7 | 0 44 12.25 | 2.2209 | 0 32 45.9 | 16.419 | 7 | 2 30 16.26 | 2.3232 | 12 52 55.9 | 13.855 |
| 8 | 0 46 25.46 | 2.2193 | 0 49 10.6 | 16.402 | 8 | 2 32 29.70 | 2.3247 | 13 6 44.6 | 13.767 |
| 9 | 0 48 38.57 | 2.2178 | 1 5 34.2 | 16.384 | 9 | 2 34 43.22 | 2.3261 | 13 20 28.0 | 13.679 |
| 10 | 0 50 51.60 | 2.2165 | 1 21 56.7 | 16.364 | 10 | 2 36 56.83 | 2.3277 | 13 34 6.1 | 13.590 |
| 11 | 0 53 4.55 | 2.2152 | 1 38 17.9 | 16.342 | 11 | 2 39 10.54 | 2.3293 | 13 47 38.8 | 13.499 |
| 12 | 0 55 17.42 | 2.2139 | 1 54 37.7 | 16.318 | 12 | 2 41 24.35 | 2.3310 | 14 1 6.0 | 13.407 |
| 13 | 0 57 30.22 | 2.2127 | 2 10 56.0 | 16.293 | 13 | 2 43 38.26 | 2.3327 | 14 14 27.7 | 13.314 |
| 14 | 0 59 42.95 | 2.2116 | 2 27 12.8 | 16.266 | 14 | 2 45 52.27 | 2.3344 | 14 27 43.7 | 13.219 |
| 15 | 1 1 55.61 | 2.2105 | 2 43 27.9 | 16.237 | 15 | 2 48 6.38 | 2.3361 | 14 40 54.0 | 13.124 |
| 16 | 1 4 8.21 | 2.2096 | 2 59 41.2 | 16.207 | 16 | 2 50 20.60 | 2.3379 | 14 53 58.6 | 13.028 |
| 17 | 1 6 20.76 | 2.2087 | 3 15 52.7 | 16.175 | 17 | 2 52 34.93 | 2.3397 | 15 6 57.4 | 12.930 |
| 18 | 1 8 33.26 | 2.2079 | 3 32 2.2 | 16.141 | 18 | 2 54 49.37 | 2.3416 | 15 19 50.2 | 12.831 |
| 19 | 1 10 45.71 | 2.2072 | 3 48 9.6 | 16.106 | 19 | 2 57 3.92 | 2.3435 | 15 32 37.1 | 12.732 |
| 20 | 1 12 58.12 | 2.2064 | 4 4 14.9 | 16.069 | 20 | 2 59 18.59 | 2.3454 | 15 45 18.0 | 12.631 |
| 21 | 1 15 10.48 | 2.2057 | 4 20 17.9 | 16.030 | 21 | 3 1 33.37 | 2.3473 | 15 57 52.8 | 12.529 |
| 22 | 1 17 22.81 | 2.2050 | 4 36 18.5 | 15.990 | 22 | 3 3 48.27 | 2.3493 | 16 10 21.4 | 12.426 |
| 23 | 1 19 35.11 | 2.2048 | 4 52 16.7 | 15.950 | 23 | 3 6 3.29 | 2.3513 | 16 22 43.9 | 12.322 |
| 24 | 1 21 47.39 | 2.2044 | N. 5 8 12.5 | 15.908 | 24 | 3 8 18.43 | 2.3533 | N. 16 35 0.1 | 12.217 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|--|---------------------|----------------|---------------------|--------------|---|---------------------|----------------|---------------------|
| TUESDAY 25. | | | | | THURSDAY 27. | | | | |
| 0 | ^h 3 ^m 8 ^s 18.43 | 2.2533 | N.16° 35' 0".1 | 12.917 | 0 | ^h 4 ^m 58 ^s 52.44 | 2.3475 | N.24° 3' 18.8" | 6.178 |
| 1 | 3 10 33.69 | 2.2553 | 16 47 9.9 | 12.110 | 1 | 5 1 13.33 | 2.3487 | 24 9 25.3 | 6.037 |
| 2 | 3 12 49.07 | 2.2574 | 16 59 13.3 | 12.003 | 2 | 5 3 34.29 | 2.3499 | 24 15 23.3 | 5.896 |
| 3 | 3 15 4.58 | 2.2595 | 17 11 10.3 | 11.896 | 3 | 5 5 55.32 | 2.3511 | 24 21 12.8 | 5.754 |
| 4 | 3 17 20.21 | 2.2616 | 17 23 0.8 | 11.787 | 4 | 5 8 16.42 | 2.3522 | 24 26 53.8 | 5.612 |
| 5 | 3 19 35.97 | 2.2637 | 17 34 44.7 | 11.676 | 5 | 5 10 37.58 | 2.3531 | 24 32 26.2 | 5.469 |
| 6 | 3 21 51.86 | 2.2659 | 17 46 21.9 | 11.564 | 6 | 5 12 58.79 | 2.3540 | 24 37 50.1 | 5.326 |
| 7 | 3 24 7.88 | 2.2680 | 17 57 52.4 | 11.452 | 7 | 5 15 20.06 | 2.3549 | 24 43 5.4 | 5.183 |
| 8 | 3 26 24.02 | 2.2701 | 18 9 16.2 | 11.340 | 8 | 5 17 41.38 | 2.3557 | 24 48 12.1 | 5.039 |
| 9 | 3 28 40.29 | 2.2723 | 18 20 33.2 | 11.226 | 9 | 5 20 2.75 | 2.3565 | 24 53 10.1 | 4.895 |
| 10 | 3 30 56.69 | 2.2745 | 18 31 43.3 | 11.111 | 10 | 5 22 24.16 | 2.3572 | 24 57 59.5 | 4.752 |
| 11 | 3 33 13.23 | 2.2767 | 18 42 46.5 | 10.995 | 11 | 5 24 45.61 | 2.3578 | 25 2 40.3 | 4.608 |
| 12 | 3 35 29.90 | 2.2789 | 18 53 42.7 | 10.878 | 12 | 5 27 7.10 | 2.3584 | 25 7 12.5 | 4.464 |
| 13 | 3 37 46.70 | 2.2811 | 19 4 31.9 | 10.761 | 13 | 5 29 28.62 | 2.3588 | 25 11 36.0 | 4.319 |
| 14 | 3 40 3.63 | 2.2832 | 19 15 14.0 | 10.642 | 14 | 5 31 50.16 | 2.3592 | 25 15 50.8 | 4.174 |
| 15 | 3 42 20.69 | 2.2854 | 19 25 49.0 | 10.523 | 15 | 5 34 11.73 | 2.3596 | 25 19 56.9 | 4.029 |
| 16 | 3 44 37.88 | 2.2877 | 19 36 16.8 | 10.402 | 16 | 5 36 33.31 | 2.3598 | 25 23 54.3 | 3.883 |
| 17 | 3 46 55.21 | 2.2899 | 19 46 37.3 | 10.281 | 17 | 5 38 54.91 | 2.3601 | 25 27 42.9 | 3.738 |
| 18 | 3 49 12.67 | 2.2921 | 19 56 50.5 | 10.159 | 18 | 5 41 16.52 | 2.3603 | 25 31 22.9 | 3.594 |
| 19 | 3 51 30.26 | 2.2942 | 20 6 56.3 | 10.036 | 19 | 5 43 38.14 | 2.3603 | 25 34 54.2 | 3.448 |
| 20 | 3 53 47.98 | 2.2964 | 20 16 54.8 | 9.913 | 20 | 5 45 59.75 | 2.3608 | 25 38 16.7 | 3.302 |
| 21 | 3 56 5.83 | 2.2986 | 20 26 45.9 | 9.789 | 21 | 5 48 21.36 | 2.3601 | 25 41 30.5 | 3.157 |
| 22 | 3 58 23.81 | 2.3007 | 20 36 29.5 | 9.664 | 22 | 5 50 42.96 | 2.3599 | 25 44 35.5 | 3.011 |
| 23 | 4 0 41.92 | 2.3028 | N.20 46 5.5 | 9.538 | 23 | 5 53 4.54 | 2.3596 | N.25 47 31.8 | 2.866 |
| WEDNESDAY 26. | | | | | FRIDAY 28. | | | | |
| 0 | 4 3 0.15 | 2.3049 | N.20 55 34.0 | 9.412 | 0 | 5 55 26.11 | 2.3593 | N.25 50 19.4 | 2.720 |
| 1 | 4 5 18.51 | 2.3071 | 21 4 54.9 | 9.284 | 1 | 5 57 47.66 | 2.3589 | 25 52 58.2 | 2.574 |
| 2 | 4 7 37.00 | 2.3092 | 21 14 8.1 | 9.155 | 2 | 6 0 9.18 | 2.3584 | 25 55 28.3 | 2.429 |
| 3 | 4 9 55.62 | 2.3113 | 21 23 13.5 | 9.026 | 3 | 6 2 30.66 | 2.3578 | 25 57 49.7 | 2.284 |
| 4 | 4 12 14.36 | 2.3133 | 21 32 11.2 | 8.897 | 4 | 6 4 52.11 | 2.3572 | 26 0 2.4 | 2.138 |
| 5 | 4 14 33.22 | 2.3153 | 21 41 1.1 | 8.767 | 5 | 6 7 13.52 | 2.3564 | 26 2 6.3 | 1.992 |
| 6 | 4 16 52.20 | 2.3173 | 21 49 43.2 | 8.636 | 6 | 6 9 34.88 | 2.3556 | 26 4 1.5 | 1.847 |
| 7 | 4 19 11.30 | 2.3193 | 21 58 17.4 | 8.504 | 7 | 6 11 56.19 | 2.3547 | 26 5 48.0 | 1.702 |
| 8 | 4 21 30.52 | 2.3213 | 22 6 43.7 | 8.372 | 8 | 6 14 17.44 | 2.3537 | 26 7 25.8 | 1.557 |
| 9 | 4 23 49.86 | 2.3232 | 22 15 2.1 | 8.240 | 9 | 6 16 38.64 | 2.3527 | 26 8 54.9 | 1.412 |
| 10 | 4 26 9.31 | 2.3252 | 22 23 12.5 | 8.106 | 10 | 6 18 59.77 | 2.3515 | 26 10 15.3 | 1.267 |
| 11 | 4 28 28.88 | 2.3271 | 22 31 14.8 | 7.971 | 11 | 6 21 20.82 | 2.3503 | 26 11 27.0 | 1.123 |
| 12 | 4 30 48.56 | 2.3289 | 22 39 9.0 | 7.836 | 12 | 6 23 41.80 | 2.3490 | 26 12 30.1 | 0.979 |
| 13 | 4 33 8.34 | 2.3306 | 22 46 55.1 | 7.701 | 13 | 6 26 2.70 | 2.3476 | 26 13 24.5 | 0.835 |
| 14 | 4 35 28.23 | 2.3324 | 22 54 33.1 | 7.566 | 14 | 6 28 23.51 | 2.3462 | 26 14 10.3 | 0.692 |
| 15 | 4 37 48.23 | 2.3342 | 23 2 3.0 | 7.430 | 15 | 6 30 44.24 | 2.3447 | 26 14 47.5 | 0.548 |
| 16 | 4 40 8.33 | 2.3358 | 23 9 24.7 | 7.292 | 16 | 6 33 4.87 | 2.3430 | 26 15 16.0 | 0.404 |
| 17 | 4 42 28.53 | 2.3374 | 23 16 38.1 | 7.154 | 17 | 6 35 25.40 | 2.3413 | 26 15 36.0 | 0.260 |
| 18 | 4 44 48.82 | 2.3390 | 23 23 43.2 | 7.016 | 18 | 6 37 45.83 | 2.3396 | 26 15 47.4 | + 0.119 |
| 19 | 4 47 9.21 | 2.3406 | 23 30 40.0 | 6.877 | 19 | 6 40 6.15 | 2.3377 | 26 15 50.3 | - 0.023 |
| 20 | 4 49 29.69 | 2.3420 | 23 37 28.5 | 6.739 | 20 | 6 42 26.35 | 2.3367 | 26 15 44.6 | 0.166 |
| 21 | 4 51 50.25 | 2.3434 | 23 44 8.7 | 6.600 | 21 | 6 44 46.43 | 2.3357 | 26 15 30.4 | 0.307 |
| 22 | 4 54 10.90 | 2.3448 | 23 50 40.5 | 6.460 | 22 | 6 47 6.39 | 2.3317 | 26 15 7.7 | 0.448 |
| 23 | 4 56 31.63 | 2.3462 | 23 57 3.9 | 6.319 | 23 | 6 49 26.23 | 2.3295 | 26 14 36.6 | 0.589 |
| 24 | 4 58 52.44 | 2.3475 | N.24 3 18.8 | 6.178 | 24 | 6 51 45.93 | 2.3272 | N.26 13 57.0 | 0.730 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|--------------|---------------------|--|------------------|---------------------|--------------|---------------------|
| SATURDAY 29. | | | | | MONDAY 31. | | | | |
| 0 | 6 51 45.93 | 2.3279 | N.26 13 57.0 | 0.730 | 0 | 8 39 38.17 | 2.1481 | N.23 8 9.6 | 6.735 |
| 1 | 6 54 5.49 | 2.3248 | 26 13 9.0 | 0.870 | 1 | 8 41 46.91 | 2.1434 | 23 1 22.3 | 6.840 |
| 2 | 6 56 24.91 | 2.3225 | 26 12 12.6 | 1.009 | 2 | 8 43 55.37 | 2.1387 | 22 54 28.8 | 6.944 |
| 3 | 6 58 44.19 | 2.3201 | 26 11 7.9 | 1.148 | 3 | 8 46 3.55 | 2.1340 | 22 47 29.0 | 7.048 |
| 4 | 7 1 3.32 | 2.3175 | 26 9 54.8 | 1.287 | 4 | 8 48 11.45 | 2.1292 | 22 40 23.0 | 7.152 |
| 5 | 7 3 22.29 | 2.3148 | 26 8 33.4 | 1.425 | 5 | 8 50 19.06 | 2.1245 | 22 33 10.8 | 7.254 |
| 6 | 7 5 41.09 | 2.3120 | 26 7 3.8 | 1.562 | 6 | 8 52 26.39 | 2.1197 | 22 25 52.5 | 7.355 |
| 7 | 7 7 59.73 | 2.3093 | 26 5 25.9 | 1.700 | 7 | 8 54 33.43 | 2.1150 | 22 18 28.2 | 7.455 |
| 8 | 7 10 18.21 | 2.3066 | 26 3 39.8 | 1.837 | 8 | 8 56 40.19 | 2.1102 | 22 10 57.9 | 7.554 |
| 9 | 7 12 36.52 | 2.3037 | 26 1 45.5 | 1.973 | 9 | 8 58 46.66 | 2.1054 | 22 3 21.7 | 7.652 |
| 10 | 7 14 54.65 | 2.3006 | 25 59 43.0 | 2.109 | 10 | 9 0 52.84 | 2.1007 | 21 55 39.6 | 7.750 |
| 11 | 7 17 12.59 | 2.2975 | 25 57 32.4 | 2.243 | 11 | 9 2 58.74 | 2.0959 | 21 47 51.7 | 7.847 |
| 12 | 7 19 30.35 | 2.2944 | 25 55 13.8 | 2.377 | 12 | 9 5 4.35 | 2.0911 | 21 39 58.0 | 7.942 |
| 13 | 7 21 47.92 | 2.2912 | 25 52 47.1 | 2.511 | 13 | 9 7 9.67 | 2.0863 | 21 31 58.6 | 8.037 |
| 14 | 7 24 5.30 | 2.2880 | 25 50 12.4 | 2.645 | 14 | 9 9 14.71 | 2.0816 | 21 23 53.6 | 8.130 |
| 15 | 7 26 22.48 | 2.2847 | 25 47 29.7 | 2.777 | 15 | 9 11 19.46 | 2.0768 | 21 15 43.0 | 8.223 |
| 16 | 7 28 39.46 | 2.2813 | 25 44 39.1 | 2.909 | 16 | 9 13 23.93 | 2.0721 | 21 7 26.9 | 8.315 |
| 17 | 7 30 56.24 | 2.2779 | 25 41 40.6 | 3.040 | 17 | 9 15 28.11 | 2.0673 | 20 59 5.2 | 8.407 |
| 18 | 7 33 12.81 | 2.2744 | 25 38 34.3 | 3.171 | 18 | 9 17 32.01 | 2.0626 | 20 50 38.1 | 8.496 |
| 19 | 7 35 29.17 | 2.2708 | 25 35 20.1 | 3.302 | 19 | 9 19 35.62 | 2.0578 | 20 42 5.7 | 8.585 |
| 20 | 7 37 45.31 | 2.2672 | 25 31 58.1 | 3.431 | 20 | 9 21 38.95 | 2.0531 | 20 33 27.9 | 8.673 |
| 21 | 7 40 1.23 | 2.2635 | 25 28 28.4 | 3.559 | 21 | 9 23 42.00 | 2.0484 | 20 24 44.9 | 8.760 |
| 22 | 7 42 16.93 | 2.2597 | 25 24 51.0 | 3.686 | 22 | 9 25 44.76 | 2.0437 | 20 15 56.7 | 8.846 |
| 23 | 7 44 32.40 | 2.2560 | N.25 21 6.0 | 3.813 | 23 | 9 27 47.24 | 2.0390 | N.20 7 3.4 | 8.931 |
| SUNDAY 30. | | | | | TUESDAY, SEPTEMBER 1. | | | | |
| 0 | 7 46 47.65 | 2.2522 | N.25 17 13.4 | 3.940 | 0 | 9 29 49.44 | 2.0343 | N.19 58 5.0 | 9.015 |
| 1 | 7 49 2.67 | 2.2483 | 25 13 13.2 | 4.066 | PHASES OF THE MOON. . | | | | |
| 2 | 7 51 17.45 | 2.2443 | 25 9 5.5 | 4.191 | | | | | |
| 3 | 7 53 31.99 | 2.2403 | 25 4 50.3 | 4.316 | | | | | |
| 4 | 7 55 46.29 | 2.2363 | 25 0 27.6 | 4.439 | | | | | |
| 5 | 7 58 0.35 | 2.2322 | 24 55 57.6 | 4.561 | <div> <div> <div>●</div> <div>New Moon . August</div> </div> <div> <div>d</div> <div>4</div> <div>h</div> <div>5</div> <div>m</div> <div>12.2</div> </div> </div> | | | | |
| 6 | 8 0 14.16 | 2.2281 | 24 51 20.3 | 4.683 | | | | | |
| 7 | 8 2 27.72 | 2.2239 | 24 46 35.7 | 4.804 | | | | | |
| 8 | 8 4 41.03 | 2.2197 | 24 41 43.8 | 4.925 | | | | | |
| 9 | 8 6 54.09 | 2.2155 | 24 36 44.7 | 5.044 | <div> <div> <div>☾</div> <div>First Quarter</div> </div> <div> <div>d</div> <div>12</div> <div>h</div> <div>9</div> <div>m</div> <div>11.7</div> </div> </div> | | | | |
| 10 | 8 9 6.89 | 2.2113 | 24 31 38.5 | 5.163 | | | | | |
| 11 | 8 11 19.44 | 2.2070 | 24 26 25.2 | 5.281 | | | | | |
| 12 | 8 13 31.73 | 2.2026 | 24 21 4.8 | 5.398 | | | | | |
| 13 | 8 15 43.75 | 2.1982 | 24 15 37.4 | 5.514 | <div> <div> <div>○</div> <div>Full Moon</div> </div> <div> <div>d</div> <div>19</div> <div>h</div> <div>9</div> <div>m</div> <div>28.3</div> </div> </div> | | | | |
| 14 | 8 17 55.51 | 2.1937 | 24 10 3.1 | 5.629 | | | | | |
| 15 | 8 20 7.00 | 2.1892 | 24 4 21.9 | 5.744 | | | | | |
| 16 | 8 22 18.22 | 2.1847 | 23 58 33.8 | 5.857 | | | | | |
| 17 | 8 24 29.17 | 2.1803 | 23 52 39.0 | 5.969 | <div> <div> <div>☾</div> <div>Apogee . . . August</div> </div> <div> <div>d</div> <div>7</div> <div>h</div> <div>22.2</div> </div> </div> | | | | |
| 18 | 8 26 39.86 | 2.1758 | 23 46 37.5 | 6.081 | | | | | |
| 19 | 8 28 50.27 | 2.1712 | 23 40 29.3 | 6.192 | | | | | |
| 20 | 8 31 0.40 | 2.1666 | 23 34 14.4 | 6.303 | | | | | |
| 21 | 8 33 10.26 | 2.1620 | 23 27 52.9 | 6.412 | <div> <div> <div>☾</div> <div>Perigee</div> </div> <div> <div>d</div> <div>20</div> <div>h</div> <div>8.9</div> </div> </div> | | | | |
| 22 | 8 35 19.84 | 2.1573 | 23 21 24.9 | 6.520 | | | | | |
| 23 | 8 37 29.14 | 2.1527 | 23 14 50.5 | 6.628 | | | | | |
| 24 | 8 39 38.17 | 2.1481 | N.23 8 9.6 | 6.735 | | | | | |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|
| 1 | Fomalhaut W. | 118° 20' 41" | 2974 | 119° 51' 26" | 2991 | 121° 21' 50" | 3008 | 122° 51' 53" | 3025 |
| | α Pegasi W. | 98 30 54 | 3156 | 99 57 56 | 3168 | 101 24 43 | 3183 | 102 51 13 | 3198 |
| | α Arietis W. | 55 51 14 | 2990 | 57 23 46 | 2994 | 58 56 13 | 2998 | 60 28 35 | 2999 |
| | Aldebaran W. | 24 52 17 | 2971 | 26 25 13 | 2966 | 27 58 15 | 2964 | 29 31 20 | 2962 |
| | Sun E. | 37 5 19 | 3196 | 35 37 41 | 3139 | 34 10 19 | 3150 | 32 43 12 | 3166 |
| 2 | α Arietis W. | 68 8 51 | 2998 | 69 40 34 | 2935 | 71 12 9 | 2941 | 72 43 36 | 2946 |
| | Aldebaran W. | 37 16 32 | 2975 | 38 49 23 | 2979 | 40 22 9 | 2983 | 41 54 49 | 2989 |
| | Sun E. | 25 31 55 | 2943 | 24 6 37 | 2969 | 22 41 41 | 2983 | 21 17 10 | 2998 |
| 5 | Sun W. | 10 3 7 | 3817 | 11 17 52 | 3731 | 12 34 6 | 3665 | 13 51 30 | 3616 |
| | Spica E. | 61 9 18 | 3014 | 59 39 23 | 3021 | 58 9 36 | 3027 | 56 39 57 | 3034 |
| | Antares E. | 107 1 51 | 3001 | 105 31 40 | 3007 | 104 1 36 | 3013 | 102 31 39 | 3018 |
| 6 | Sun W. | 20 27 43 | 3514 | 21 47 52 | 3506 | 23 8 9 | 3500 | 24 28 33 | 3495 |
| | Spica E. | 49 13 45 | 3066 | 47 44 54 | 3073 | 46 16 11 | 3079 | 44 47 36 | 3085 |
| | Antares E. | 95 3 35 | 3044 | 93 34 17 | 3049 | 92 5 5 | 3053 | 90 35 58 | 3058 |
| 7 | Sun W. | 31 11 27 | 3486 | 32 32 7 | 3486 | 33 52 47 | 3486 | 35 13 27 | 3486 |
| | Spica E. | 37 26 34 | 3117 | 35 58 45 | 3194 | 34 31 4 | 3131 | 33 3 32 | 3138 |
| | Antares E. | 83 11 39 | 3076 | 81 43 0 | 3078 | 80 14 24 | 3082 | 78 45 52 | 3084 |
| 8 | Sun W. | 41 56 56 | 3482 | 43 17 40 | 3481 | 44 38 25 | 3480 | 45 59 11 | 3480 |
| | Antares E. | 71 23 50 | 3092 | 69 55 31 | 3093 | 68 27 13 | 3094 | 66 58 56 | 3094 |
| | α Aquilæ E. | 115 40 23 | 4090 | 114 30 12 | 4068 | 113 19 39 | 4046 | 112 8 45 | 4027 |
| 9 | Sun W. | 52 43 29 | 3468 | 54 4 29 | 3464 | 55 25 33 | 3462 | 56 46 40 | 3457 |
| | Antares E. | 59 37 25 | 3090 | 58 9 3 | 3088 | 56 40 39 | 3086 | 55 12 12 | 3083 |
| | α Aquilæ E. | 106 9 42 | 3942 | 104 57 5 | 3998 | 103 44 14 | 3915 | 102 31 9 | 3902 |
| 10 | Sun W. | 63 33 33 | 3432 | 64 55 13 | 3425 | 66 17 1 | 3418 | 67 38 57 | 3410 |
| | Antares E. | 47 49 2 | 3065 | 46 20 10 | 3061 | 44 51 13 | 3056 | 43 22 10 | 3051 |
| | α Aquilæ E. | 96 22 43 | 3848 | 95 8 30 | 3838 | 93 54 7 | 3829 | 92 39 35 | 3821 |
| 11 | Sun W. | 74 30 51 | 3368 | 75 53 44 | 3358 | 77 16 48 | 3348 | 78 40 4 | 3337 |
| | Antares E. | 35 55 11 | 3022 | 34 25 25 | 3015 | 32 55 31 | 3009 | 31 25 29 | 3001 |
| | α Aquilæ E. | 86 24 59 | 3787 | 85 9 43 | 3789 | 83 54 22 | 3777 | 82 38 56 | 3772 |
| | Fomalhaut E. | 118 10 23 | 3212 | 116 44 28 | 3197 | 115 18 15 | 3183 | 113 51 45 | 3162 |
| 12 | Sun W. | 85 39 43 | 3276 | 87 4 23 | 3263 | 88 29 18 | 3249 | 89 54 29 | 3235 |
| | Spica W. | 23 3 3 | 3090 | 24 32 51 | 2995 | 26 3 10 | 2979 | 27 33 58 | 2950 |
| | α Aquilæ E. | 76 20 50 | 3761 | 75 5 7 | 3761 | 73 49 24 | 3762 | 72 33 42 | 3765 |
| | Fomalhaut E. | 106 24 48 | 3093 | 105 6 30 | 3078 | 103 37 54 | 3063 | 102 8 59 | 3048 |
| | α Pegasi E. | 123 51 53 | 3497 | 122 31 26 | 3466 | 121 10 24 | 3435 | 119 48 47 | 3404 |
| 13 | Sun W. | 97 4 48 | 3158 | 98 31 48 | 3141 | 99 59 8 | 3124 | 101 26 48 | 3106 |
| | Spica W. | 35 14 38 | 2948 | 36 48 3 | 2929 | 38 21 53 | 2910 | 39 56 8 | 2792 |
| | α Aquilæ E. | 66 16 10 | 3792 | 65 1 0 | 3804 | 63 46 2 | 3817 | 62 31 17 | 3822 |
| | Fomalhaut E. | 94 39 38 | 2969 | 93 8 47 | 2954 | 91 37 36 | 2938 | 90 6 5 | 2921 |
| | α Pegasi E. | 112 52 24 | 3267 | 111 27 34 | 3241 | 110 2 13 | 3216 | 108 36 23 | 3191 |
| 14 | Sun W. | 108 50 33 | 3017 | 110 20 25 | 2997 | 111 50 41 | 2979 | 113 21 20 | 2961 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|----|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|
| 1 | Fomalhaut | W. | 124° 21' 35" | 3043 | 125° 50' 54" | 3084 | 127° 19' 48" | 3084 | 128° 48' 17" | 3105 |
| | α Pegasi | W. | 104 17 27 | 3011 | 105 43 23 | 3025 | 107 9 2 | 3042 | 108 34 22 | 3059 |
| | α Arietis | W. | 62 0 51 | 2907 | 63 33 1 | 2918 | 65 5 5 | 2917 | 66 37 2 | 2924 |
| | Aldebaran | W. | 31 4 27 | 2863 | 32 37 33 | 2866 | 34 10 36 | 2868 | 35 43 36 | 2871 |
| 2 | Sun | E. | 31 16 22 | 3179 | 29 49 48 | 3124 | 28 23 32 | 3209 | 26 57 34 | 3225 |
| | α Arietis | W. | 74 14 56 | 2953 | 75 46 8 | 2960 | 77 17 11 | 2966 | 78 48 6 | 2973 |
| | Aldebaran | W. | 43 27 22 | 2894 | 44 59 48 | 2899 | 46 32 8 | 2905 | 48 4 20 | 2911 |
| | Sun | E. | 19 53 8 | 3336 | 18 29 38 | 3366 | 17 6 43 | 3402 | 15 44 29 | 3444 |
| 5 | Sun | W. | 15 9 47 | 3581 | 16 28 42 | 3557 | 17 48 3 | 3538 | 19 7 45 | 3524 |
| | Spica | E. | 55 10 27 | 3040 | 53 41 4 | 3047 | 52 11 50 | 3054 | 50 42 44 | 3060 |
| | Antares | E. | 101 1 49 | 3094 | 99 32 6 | 3089 | 98 2 29 | 3034 | 96 32 59 | 3039 |
| 6 | Sun | W. | 25 49 3 | 3492 | 27 9 36 | 3480 | 28 30 11 | 3488 | 29 50 48 | 3467 |
| | Spica | E. | 43 19 8 | 3091 | 41 50 48 | 3098 | 40 22 36 | 3104 | 38 54 31 | 3110 |
| | Antares | E. | 89 6 57 | 3069 | 87 38 1 | 3065 | 86 9 9 | 3069 | 84 40 22 | 3073 |
| 7 | Sun | W. | 36 34 8 | 3485 | 37 54 49 | 3484 | 39 15 31 | 3484 | 40 36 13 | 3483 |
| | Spica | E. | 31 36 8 | 3146 | 30 8 54 | 3154 | 28 41 50 | 3163 | 27 14 56 | 3173 |
| | Antares | E. | 77 17 23 | 3066 | 75 48 56 | 3068 | 74 20 32 | 3090 | 72 52 10 | 3091 |
| 8 | Sun | W. | 47 19 58 | 3478 | 48 40 47 | 3475 | 50 1 39 | 3473 | 51 22 33 | 3471 |
| | Antares | E. | 65 30 39 | 3094 | 64 2 22 | 3093 | 62 34 4 | 3092 | 61 5 45 | 3091 |
| | α Aquilæ | E. | 110 57 32 | 4008 | 109 46 0 | 3989 | 108 34 10 | 3973 | 107 22 4 | 3957 |
| 9 | Sun | W. | 58 7 52 | 3453 | 59 29 9 | 3448 | 60 50 31 | 3443 | 62 11 59 | 3438 |
| | Antares | E. | 53 43 42 | 3080 | 52 15 8 | 3078 | 50 46 31 | 3073 | 49 17 49 | 3069 |
| | α Aquilæ | E. | 101 17 51 | 3890 | 100 4 21 | 3878 | 98 50 39 | 3867 | 97 36 46 | 3857 |
| 10 | Sun | W. | 69 1 2 | 3403 | 70 23 15 | 3395 | 71 45 37 | 3388 | 73 8 9 | 3378 |
| | Antares | E. | 41 53 0 | 3046 | 40 23 44 | 3039 | 38 54 20 | 3034 | 37 24 49 | 3028 |
| | α Aquilæ | E. | 91 24 55 | 3814 | 90 10 7 | 3806 | 88 55 11 | 3799 | 87 40 8 | 3793 |
| 11 | Sun | W. | 80 3 33 | 3325 | 81 27 15 | 3314 | 82 51 10 | 3302 | 84 15 19 | 3289 |
| | Antares | E. | 29 55 18 | 2995 | 28 24 59 | 2989 | 26 54 33 | 2984 | 25 24 0 | 2978 |
| | α Aquilæ | E. | 81 23 25 | 3788 | 80 7 50 | 3766 | 78 52 12 | 3764 | 77 36 32 | 3769 |
| | Fomalhaut | E. | 112 24 57 | 3153 | 110 57 51 | 3138 | 109 30 28 | 3124 | 108 2 47 | 3109 |
| 12 | Sun | W. | 91 19 57 | 3290 | 92 45 43 | 3285 | 94 11 46 | 3189 | 95 38 8 | 3174 |
| | Spica | W. | 29 5 13 | 2920 | 30 36 55 | 2908 | 32 9 4 | 2888 | 33 41 38 | 2868 |
| | α Aquilæ | E. | 71 18 3 | 3768 | 70 2 27 | 3771 | 68 46 55 | 3777 | 67 31 29 | 3784 |
| | Fomalhaut | E. | 100 39 46 | 3032 | 99 10 13 | 3017 | 97 40 21 | 3001 | 96 10 9 | 2985 |
| | α Pegasi | E. | 118 26 35 | 3375 | 117 3 50 | 3347 | 115 40 33 | 3319 | 114 16 44 | 3293 |
| 13 | Sun | W. | 102 54 50 | 3089 | 104 23 13 | 3072 | 105 51 57 | 3053 | 107 21 4 | 3035 |
| | Spica | W. | 41 30 47 | 2772 | 43 5 52 | 2753 | 44 41 21 | 2735 | 46 17 15 | 2715 |
| | α Aquilæ | E. | 61 16 48 | 3850 | 60 2 37 | 3869 | 58 48 46 | 3893 | 57 35 19 | 3920 |
| | Fomalhaut | E. | 88 34 13 | 2905 | 87 2 1 | 2889 | 85 29 28 | 2873 | 83 56 34 | 2857 |
| | α Pegasi | E. | 107 10 3 | 3168 | 105 43 15 | 3143 | 104 15 58 | 3121 | 102 48 14 | 3098 |
| 14 | Sun | W. | 114 52 22 | 2941 | 116 23 49 | 2922 | 117 55 40 | 2902 | 119 27 56 | 2883 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|-------------|----------------|------------|----------------|------------|----------------|
| 14 | Spica W. | 47° 53' 35" | 2695 | 49° 30' 21" | 2677 | 51° 7' 32" | 2657 | 52° 45' 9" | 2638 |
| | α Aquilæ E. | 56 22 20 | 2651 | 55 9 52 | 2685 | 53 57 58 | 2623 | 52 46 44 | 2671 |
| | Fomalhaut E. | 82 23 20 | 2641 | 80 49 45 | 2625 | 79 15 49 | 2608 | 77 41 32 | 2793 |
| | α Pegasi E. | 101 20 2 | 3076 | 99 51 23 | 3054 | 98 22 17 | 3033 | 96 52 45 | 3012 |
| 15 | Sun W. | 121 0 36 | 2663 | 122 33 42 | 2645 | 124 7 12 | 2625 | 125 41 8 | 2606 |
| | Spica W. | 60 59 50 | 2541 | 62 40 6 | 2521 | 64 20 50 | 2502 | 66 2 1 | 2489 |
| | Antares W. | 15 19 38 | 2657 | 16 57 15 | 2614 | 18 35 51 | 2577 | 20 15 18 | 2543 |
| | Fomalhaut E. | 69 45 5 | 2718 | 68 8 49 | 2704 | 66 32 14 | 2690 | 64 55 21 | 2678 |
| | α Pegasi E. | 89 18 46 | 2915 | 87 46 46 | 2897 | 86 14 23 | 2880 | 84 41 38 | 2862 |
| 16 | Spica W. | 74 34 41 | 2387 | 76 18 34 | 2368 | 78 2 54 | 2350 | 79 47 40 | 2332 |
| | Antares W. | 28 42 56 | 2411 | 30 26 15 | 2389 | 32 10 6 | 2367 | 33 54 28 | 2346 |
| | Fomalhaut E. | 56 46 58 | 2626 | 55 8 38 | 2618 | 53 30 8 | 2613 | 51 51 31 | 2609 |
| | α Pegasi E. | 76 52 48 | 2791 | 75 18 8 | 2780 | 73 43 14 | 2769 | 72 8 6 | 2760 |
| | α Arietis E. | 119 13 9 | 2495 | 117 31 49 | 2479 | 115 49 57 | 2451 | 114 7 35 | 2429 |
| 17 | Spica W. | 88 38 1 | 2246 | 90 25 20 | 2230 | 92 13 3 | 2214 | 94 1 10 | 2199 |
| | Antares W. | 42 43 41 | 2250 | 44 30 54 | 2233 | 46 18 33 | 2215 | 48 6 38 | 2199 |
| | Fomalhaut E. | 43 38 1 | 2624 | 41 59 39 | 2636 | 40 21 33 | 2654 | 38 43 51 | 2676 |
| | α Pegasi E. | 64 10 1 | 2737 | 62 34 10 | 2737 | 60 58 19 | 2740 | 59 22 32 | 2746 |
| | α Arietis E. | 105 28 25 | 2332 | 103 43 12 | 2315 | 101 57 34 | 2298 | 100 11 31 | 2281 |
| 18 | Spica W. | 103 7 9 | 2131 | 104 57 21 | 2119 | 106 47 51 | 2108 | 108 38 38 | 2097 |
| | Antares W. | 57 12 52 | 2126 | 59 3 11 | 2113 | 60 53 50 | 2101 | 62 44 47 | 2090 |
| | α Pegasi E. | 51 26 46 | 2621 | 49 52 45 | 2618 | 48 19 20 | 2681 | 46 46 37 | 2690 |
| | α Arietis E. | 91 15 30 | 2209 | 89 27 16 | 2196 | 87 38 43 | 2185 | 85 49 53 | 2175 |
| | Aldebaran E. | 121 49 31 | 2145 | 119 59 40 | 2132 | 118 9 29 | 2118 | 116 18 58 | 2107 |
| 19 | Spica W. | 117 56 18 | 2055 | 119 48 27 | 2049 | 121 40 45 | 2043 | 123 33 12 | 2039 |
| | Antares W. | 72 3 38 | 2043 | 73 56 5 | 2035 | 75 48 44 | 2029 | 77 41 33 | 2024 |
| | α Arietis E. | 76 42 11 | 2135 | 74 52 5 | 2130 | 73 1 52 | 2126 | 71 11 32 | 2122 |
| | Aldebaran E. | 107 2 11 | 2058 | 105 10 7 | 2050 | 103 17 51 | 2044 | 101 25 26 | 2038 |
| 20 | Antares W. | 87 7 25 | 2007 | 89 0 49 | 2005 | 90 54 15 | 2005 | 92 47 41 | 2005 |
| | α Aquilæ W. | 48 20 38 | 3668 | 49 37 59 | 3574 | 50 57 2 | 3489 | 52 17 38 | 3415 |
| | α Arietis E. | 61 59 13 | 2124 | 60 8 50 | 2128 | 58 18 33 | 2133 | 56 28 24 | 2139 |
| | Aldebaran E. | 92 1 26 | 2021 | 90 8 24 | 2020 | 88 15 21 | 2019 | 86 22 17 | 2020 |
| 21 | Antares W. | 102 14 18 | 2019 | 104 7 22 | 2024 | 106 0 19 | 2030 | 107 55 6 | 2036 |
| | α Aquilæ W. | 59 19 16 | 3144 | 60 46 32 | 3109 | 62 14 31 | 3077 | 63 43 9 | 3048 |
| | Fomalhaut W. | 24 24 37 | 2226 | 25 50 15 | 2071 | 27 19 0 | 2947 | 28 50 19 | 2847 |
| | α Arietis E. | 47 20 52 | 2196 | 45 32 19 | 2214 | 43 44 12 | 2223 | 41 56 34 | 2256 |
| | Aldebaran E. | 76 57 36 | 2035 | 75 4 56 | 2040 | 73 12 24 | 2046 | 71 20 2 | 2053 |
| | Pollux E. | 121 3 5 | 2016 | 119 9 55 | 2020 | 117 16 52 | 2025 | 115 23 57 | 2032 |
| 22 | Antares W. | 117 14 15 | 2078 | 119 5 48 | 2088 | 120 57 6 | 2099 | 122 48 7 | 2111 |
| | α Aquilæ W. | 71 13 28 | 2062 | 72 44 28 | 2054 | 74 15 39 | 2049 | 75 46 56 | 2045 |
| | Fomalhaut W. | 36 52 21 | 2566 | 38 32 3 | 2536 | 40 12 26 | 2519 | 41 53 22 | 2493 |
| | Aldebaran E. | 62 1 8 | 2098 | 60 10 5 | 2108 | 58 19 18 | 2130 | 56 28 49 | 2132 |
| | Pollux E. | 106 2 2 | 2071 | 104 10 18 | 2080 | 102 18 48 | 2090 | 100 27 34 | 2101 |
| | Sun E. | 142 50 55 | 2400 | 141 7 20 | 2408 | 139 23 56 | 2416 | 137 40 44 | 2425 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|----|-------------|----------------|------------|----------------|-------------|----------------|------------|----------------|
| 14 | Spica | W. | 54° 23' 12" | 9618 | 56° 1' 42" | 9599 | 57° 40' 38" | 9580 | 59° 20' 1" | 9561 |
| | α Aquilæ | E. | 51 36 14 | 4199 | 50 26 34 | 4180 | 49 17 49 | 4946 | 48 10 6 | 4390 |
| | Fomalhaut | E. | 76 6 55 | 9778 | 74 31 58 | 9769 | 72 56 40 | 9747 | 71 21 2 | 9739 |
| | α Pegasi | E. | 95 22 47 | 9999 | 93 52 24 | 9979 | 92 21 36 | 9959 | 90 50 23 | 9933 |
| 15 | SUN | W. | 127 15 28 | 9787 | 128 50 13 | 9768 | 130 25 23 | 9749 | 132 0 58 | 9731 |
| | Spica | W. | 67 43 39 | 9463 | 69 25 44 | 9444 | 71 8 16 | 9425 | 72 51 15 | 9406 |
| | Antares | W. | 21 55 31 | 9513 | 23 36 26 | 9485 | 25 18 0 | 9459 | 27 0 11 | 9435 |
| | Fomalhaut | E. | 63 18 11 | 9686 | 61 40 45 | 9654 | 60 3 3 | 9643 | 58 25 7 | 9634 |
| | α Pegasi | E. | 83 8 31 | 9847 | 81 35 4 | 9831 | 80 1 17 | 9817 | 78 27 11 | 9804 |
| 16 | Spica | W. | 81 32 53 | 9314 | 83 18 32 | 9297 | 85 4 36 | 9279 | 86 51 6 | 9269 |
| | Antares | W. | 35 39 21 | 9395 | 37 24 44 | 9368 | 39 10 35 | 9337 | 40 56 54 | 9308 |
| | Fomalhaut | E. | 50 12 48 | 9607 | 48 34 2 | 9607 | 46 55 17 | 9610 | 45 16 35 | 9615 |
| | α Pegasi | E. | 70 32 46 | 9759 | 68 57 15 | 9746 | 67 21 36 | 9741 | 65 45 51 | 9738 |
| | α Arietis | E. | 112 24 42 | 9400 | 110 41 20 | 9389 | 108 57 30 | 9369 | 107 13 11 | 9350 |
| 17 | Spica | W. | 95 49 39 | 9184 | 97 38 30 | 9170 | 99 27 43 | 9157 | 101 17 16 | 9143 |
| | Antares | W. | 49 55 7 | 9183 | 51 44 0 | 9169 | 53 33 15 | 9153 | 55 22 53 | 9139 |
| | Fomalhaut | E. | 37 6 39 | 9705 | 35 30 6 | 9741 | 33 54 21 | 9766 | 32 19 35 | 9749 |
| | α Pegasi | E. | 57 46 53 | 9754 | 56 11 25 | 9765 | 54 36 11 | 9779 | 53 1 16 | 9796 |
| | α Arietis | E. | 98 25 3 | 9265 | 96 38 12 | 9250 | 94 50 59 | 9236 | 93 3 25 | 9224 |
| 18 | Spica | W. | 110 29 42 | 9067 | 112 21 1 | 9078 | 114 12 34 | 9070 | 116 4 20 | 9062 |
| | Antares | W. | 64 36 2 | 9079 | 66 27 34 | 9069 | 68 19 21 | 9059 | 70 11 23 | 9051 |
| | α Pegasi | E. | 45 14 44 | 9266 | 43 43 49 | 9291 | 42 14 2 | 9264 | 40 45 33 | 9158 |
| | α Arietis | E. | 84 0 48 | 9166 | 82 11 28 | 9156 | 80 21 54 | 9148 | 78 32 8 | 9141 |
| | Aldebaran | E. | 114 28 9 | 9096 | 112 37 3 | 9085 | 110 45 40 | 9075 | 108 54 2 | 9066 |
| 19 | Spica | W. | 125 25 45 | 9035 | 127 18 24 | 9033 | 129 11 7 | 9031 | 131 3 53 | 9031 |
| | Antares | W. | 79 34 30 | 9019 | 81 27 35 | 9014 | 83 20 47 | 9011 | 85 14 4 | 9009 |
| | α Arietis | E. | 69 21 7 | 9190 | 67 30 39 | 9119 | 65 40 9 | 9190 | 63 49 40 | 9191 |
| | Aldebaran | E. | 99 32 51 | 9033 | 97 40 8 | 9029 | 95 47 19 | 9026 | 93 54 25 | 9023 |
| 20 | Antares | W. | 94 41 7 | 9007 | 96 34 31 | 9009 | 98 27 51 | 9019 | 100 21 7 | 9015 |
| | α Aquilæ | W. | 53 39 38 | 9347 | 55 2 55 | 9387 | 56 27 22 | 9334 | 57 52 51 | 9187 |
| | α Arietis | E. | 54 38 24 | 9147 | 52 48 37 | 9157 | 50 59 4 | 9168 | 49 9 48 | 9161 |
| | Aldebaran | E. | 84 29 14 | 9091 | 82 36 13 | 9094 | 80 43 16 | 9096 | 78 50 23 | 9030 |
| 21 | Antares | W. | 109 45 44 | 9043 | 111 38 11 | 9059 | 113 30 25 | 9059 | 115 22 27 | 9068 |
| | α Aquilæ | W. | 65 12 22 | 9095 | 66 42 4 | 9094 | 68 12 12 | 9067 | 69 42 41 | 9073 |
| | Fomalhaut | W. | 30 23 46 | 9766 | 31 58 58 | 9701 | 33 35 37 | 9646 | 35 13 29 | 9602 |
| | α Arietis | E. | 40 9 29 | 9281 | 38 23 2 | 9210 | 36 37 17 | 9243 | 34 52 20 | 9280 |
| | Aldebaran | E. | 69 27 50 | 9061 | 67 35 50 | 9068 | 65 44 2 | 9077 | 63 52 27 | 9067 |
| | Pollux | E. | 113 31 12 | 9038 | 111 38 37 | 9045 | 109 46 13 | 9063 | 107 54 1 | 9061 |
| 22 | Antares | W. | 124 38 50 | 9192 | 126 29 15 | 9134 | 128 19 22 | 9147 | 130 9 9 | 9162 |
| | α Aquilæ | W. | 77 18 18 | 9344 | 78 49 41 | 9245 | 80 21 3 | 9248 | 81 52 21 | 9254 |
| | Fomalhaut | W. | 43 34 45 | 9478 | 45 16 29 | 9467 | 46 58 29 | 9459 | 48 40 40 | 9453 |
| | Aldebaran | E. | 54 38 39 | 9145 | 52 48 49 | 9159 | 50 59 19 | 9173 | 49 10 11 | 9188 |
| | Pollux | E. | 98 36 36 | 9113 | 96 45 56 | 9194 | 94 55 33 | 9136 | 93 5 29 | 9149 |
| | SUN | E. | 135 57 45 | 9436 | 134 15 1 | 9445 | 132 32 31 | 9457 | 130 50 17 | 9468 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | III ^h . | P. L. of Diff. | VI ^h . | P. L. of Diff. | IX ^h . | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|--------------------|----------------|-------------------|----------------|-------------------|----------------|
| 23 | α Aquilæ W. | 83° 23' 36" | 2961 | 84° 54' 34" | 2969 | 86° 25' 26" | 2980 | 87° 56' 4" | 2999 |
| | Fomalhaut W. | 50 22 59 | 2450 | 52 5 22 | 2449 | 53 47 47 | 2450 | 55 30 10 | 2453 |
| | α Pegasi W. | 36 16 40 | 3497 | 37 37 8 | 3404 | 38 59 20 | 3394 | 40 23 4 | 3355 |
| | Aldebaran E. | 47 21 25 | 2904 | 45 33 3 | 2920 | 43 45 5 | 2937 | 41 57 33 | 2956 |
| | Pollux E. | 91 15 44 | 2162 | 89 26 19 | 2174 | 87 37 13 | 2188 | 85 48 28 | 2202 |
| | Venus E. | 122 8 1 | 2555 | 120 28 4 | 2569 | 118 48 26 | 2583 | 117 9 8 | 2598 |
| | Sun E. | 129 8 19 | 2481 | 127 26 39 | 2494 | 125 45 18 | 2508 | 124 4 16 | 2522 |
| 24 | α Aquilæ W. | 95 24 47 | 3078 | 96 53 26 | 3098 | 98 21 38 | 3121 | 99 49 22 | 3145 |
| | Fomalhaut W. | 64 0 34 | 2485 | 65 42 9 | 2494 | 67 23 30 | 2504 | 69 4 37 | 2515 |
| | α Pegasi W. | 47 38 25 | 3039 | 49 7 49 | 3014 | 50 37 44 | 2993 | 52 8 5 | 2977 |
| | Aldebaran E. | 33 6 56 | 2359 | 31 22 23 | 2384 | 29 38 25 | 2411 | 27 55 6 | 2440 |
| | Pollux E. | 76 50 5 | 2277 | 75 3 31 | 2291 | 73 17 19 | 2307 | 71 31 30 | 2323 |
| | Sun E. | 115 44 8 | 2598 | 114 5 10 | 2613 | 112 26 33 | 2629 | 110 48 18 | 2646 |
| 25 | α Aquilæ W. | 107 0 8 | 3291 | 108 24 30 | 3325 | 109 48 13 | 3361 | 111 11 14 | 3399 |
| | Fomalhaut W. | 77 26 11 | 2577 | 79 5 37 | 2591 | 80 44 44 | 2605 | 82 23 32 | 2619 |
| | α Pegasi W. | 59 43 50 | 2935 | 61 15 24 | 2934 | 62 47 0 | 2934 | 64 18 36 | 2935 |
| | Pollux E. | 62 48 10 | 2403 | 61 4 39 | 2418 | 59 21 30 | 2435 | 57 38 45 | 2450 |
| | Sun E. | 102 42 37 | 2729 | 101 6 36 | 2746 | 99 30 57 | 2763 | 97 55 40 | 2780 |
| 26 | Fomalhaut W. | 90 32 35 | 2695 | 92 9 22 | 2710 | 93 45 49 | 2726 | 95 21 54 | 2741 |
| | α Pegasi W. | 71 55 40 | 2959 | 73 26 44 | 2967 | 74 57 38 | 2975 | 76 28 22 | 2984 |
| | α Arietis W. | 28 18 3 | 2962 | 29 49 3 | 2935 | 31 20 38 | 2913 | 32 52 40 | 2897 |
| | Pollux E. | 49 10 35 | 2530 | 47 30 3 | 2545 | 45 49 53 | 2561 | 44 10 4 | 2577 |
| | Sun E. | 90 4 46 | 2692 | 88 31 39 | 2680 | 86 58 54 | 2696 | 85 26 30 | 2712 |
| 27 | Fomalhaut W. | 103 17 8 | 2822 | 104 51 7 | 2838 | 106 24 45 | 2855 | 107 58 1 | 2873 |
| | α Pegasi W. | 83 59 1 | 3037 | 85 28 28 | 3048 | 86 57 41 | 3060 | 88 26 39 | 3073 |
| | α Arietis W. | 40 36 32 | 2864 | 42 9 37 | 2864 | 43 42 42 | 2866 | 45 15 45 | 2867 |
| | Pollux E. | 35 56 17 | 2652 | 34 18 33 | 2668 | 32 41 10 | 2683 | 31 4 7 | 2698 |
| | Sun E. | 77 49 29 | 2929 | 76 19 3 | 3005 | 74 48 56 | 3019 | 73 19 7 | 3034 |
| 28 | Fomalhaut W. | 115 38 53 | 2959 | 117 9 57 | 2977 | 118 40 38 | 2996 | 120 10 56 | 3014 |
| | α Pegasi W. | 95 47 27 | 3142 | 97 14 46 | 3156 | 98 41 48 | 3171 | 100 8 32 | 3187 |
| | α Arietis W. | 52 59 57 | 2890 | 54 32 29 | 2896 | 56 4 53 | 2902 | 57 37 9 | 2909 |
| | Aldebaran W. | 22 7 18 | 2909 | 23 39 26 | 2901 | 25 11 43 | 2898 | 26 44 5 | 2894 |
| | Sun E. | 65 54 28 | 3104 | 64 26 23 | 3118 | 62 58 35 | 3130 | 61 31 2 | 3143 |
| 29 | α Pegasi W. | 107 17 26 | 3270 | 108 42 13 | 3288 | 110 6 39 | 3306 | 111 30 44 | 3325 |
| | α Arietis W. | 65 16 19 | 2943 | 66 47 43 | 2951 | 68 18 57 | 2958 | 69 50 2 | 2965 |
| | Aldebaran W. | 34 26 5 | 2904 | 35 58 19 | 2908 | 37 30 28 | 2913 | 39 2 30 | 2918 |
| | Sun E. | 54 17 4 | 3204 | 52 51 0 | 3216 | 51 25 10 | 3227 | 49 59 33 | 3239 |
| 30 | α Arietis W. | 77 23 16 | 3001 | 78 53 28 | 3008 | 80 23 31 | 3014 | 81 53 26 | 3021 |
| | Aldebaran W. | 46 40 59 | 2946 | 48 12 19 | 2952 | 49 43 32 | 2958 | 51 14 37 | 2964 |
| | Sun E. | 42 54 46 | 3294 | 41 30 27 | 3304 | 40 6 20 | 3315 | 38 42 26 | 3326 |
| 31 | α Arietis W. | 89 20 58 | 3054 | 90 50 4 | 3060 | 92 19 3 | 3066 | 93 47 54 | 3073 |
| | Aldebaran W. | 58 48 16 | 2992 | 60 18 39 | 2997 | 61 48 55 | 3002 | 63 19 5 | 3008 |
| | Pollux W. | 14 39 24 | 3028 | 16 9 2 | 3026 | 17 38 43 | 3023 | 19 8 27 | 3022 |
| | Sun E. | 31 46 4 | 3382 | 30 23 27 | 3393 | 29 1 3 | 3406 | 27 38 53 | 3420 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
| 23 | α Aquilæ W. | 89° 26' 27" | 3005 | 90° 56' 33" | 3022 | 92° 26' 19" | 3039 | 93° 55' 44" | 3056 |
| | Fomalhaut W. | 57 12 30 | 2457 | 58 54 44 | 2462 | 60 36 50 | 2469 | 62 18 47 | 2476 |
| | α Pegasi W. | 41 48 8 | 3197 | 43 14 21 | 3147 | 44 41 34 | 3105 | 46 9 38 | 3069 |
| | Aldebaran E. | 40 10 28 | 2274 | 38 23 50 | 2294 | 36 37 41 | 2315 | 34 52 3 | 2336 |
| | Pollux E. | 84 0 4 | 2217 | 82 12 2 | 2231 | 80 24 21 | 2246 | 78 37 2 | 2261 |
| | Venus E. | 115 30 10 | 2613 | 113 51 33 | 2622 | 112 13 17 | 2645 | 110 35 23 | 2661 |
| | Sun E. | 122 23 34 | 2536 | 120 43 11 | 2551 | 119 3 9 | 2566 | 117 23 28 | 2582 |
| 24 | α Aquilæ W. | 101 16 37 | 3171 | 102 43 21 | 3198 | 104 9 32 | 3228 | 105 35 8 | 3259 |
| | Fomalhaut W. | 70 45 29 | 2527 | 72 26 5 | 2538 | 74 6 25 | 2551 | 75 46 27 | 2564 |
| | α Pegasi W. | 53 38 47 | 2863 | 55 9 46 | 2853 | 56 40 58 | 2845 | 58 12 20 | 2839 |
| | Aldebaran E. | 26 12 28 | 2472 | 24 30 35 | 2508 | 22 49 33 | 2548 | 21 9 26 | 2594 |
| | Pollux E. | 69 46 4 | 2339 | 68 1 1 | 2355 | 66 16 21 | 2371 | 64 32 4 | 2387 |
| | Sun E. | 109 10 25 | 2662 | 107 32 54 | 2679 | 105 55 46 | 2695 | 104 19 0 | 2713 |
| 25 | α Aquilæ W. | 112 33 32 | 3438 | 113 55 5 | 3480 | 115 15 51 | 3525 | 116 35 48 | 3571 |
| | Fomalhaut W. | 84 2 1 | 2634 | 85 40 10 | 2649 | 87 17 59 | 2664 | 88 55 27 | 2679 |
| | α Pegasi W. | 65 50 11 | 2938 | 67 21 42 | 2942 | 68 53 8 | 2946 | 70 24 28 | 2953 |
| | Pollux E. | 55 56 22 | 2467 | 54 14 22 | 2482 | 52 32 44 | 2499 | 50 51 29 | 2514 |
| | Sun E. | 96 20 46 | 2797 | 94 46 14 | 2813 | 93 12 3 | 2830 | 91 38 14 | 2846 |
| 26 | Fomalhaut W. | 96 57 39 | 2757 | 98 33 3 | 2773 | 100 8 6 | 2789 | 101 42 48 | 2806 |
| | α Pegasi W. | 77 58 55 | 2993 | 79 29 16 | 3004 | 80 59 24 | 3014 | 82 29 19 | 3025 |
| | α Arietis W. | 34 25 3 | 2684 | 35 57 42 | 2676 | 37 30 32 | 2669 | 39 3 30 | 2666 |
| | Pollux E. | 42 30 37 | 2591 | 40 51 30 | 2607 | 39 12 45 | 2623 | 37 34 21 | 2638 |
| | Sun E. | 83 54 26 | 2927 | 82 22 42 | 2943 | 80 51 18 | 2959 | 79 20 14 | 2974 |
| 27 | Fomalhaut W. | 109 30 55 | 2890 | 111 3 27 | 2906 | 112 35 38 | 2924 | 114 7 27 | 2942 |
| | α Pegasi W. | 89 55 21 | 3087 | 91 23 47 | 3100 | 92 51 57 | 3114 | 94 19 50 | 3127 |
| | α Arietis W. | 46 48 46 | 2671 | 48 21 42 | 2675 | 49 54 33 | 2680 | 51 27 18 | 2684 |
| | Pollux E. | 29 27 24 | 2713 | 27 51 1 | 2728 | 26 14 58 | 2744 | 24 39 16 | 2759 |
| | Sun E. | 71 49 36 | 3048 | 70 20 23 | 3062 | 68 51 27 | 3077 | 67 22 49 | 3091 |
| 28 | Fomalhaut W. | 121 40 51 | 3034 | 123 10 21 | 3054 | 124 39 27 | 3075 | 126 8 7 | 3096 |
| | α Pegasi W. | 101 34 57 | 3202 | 103 1 4 | 3219 | 104 26 51 | 3235 | 105 52 19 | 3253 |
| | α Arietis W. | 59 9 16 | 2916 | 60 41 15 | 2923 | 62 13 5 | 2930 | 63 44 46 | 2936 |
| | Aldebaran W. | 28 16 31 | 2694 | 29 48 57 | 2694 | 31 21 23 | 2697 | 32 53 46 | 2700 |
| | Sun E. | 60 3 44 | 3155 | 58 36 41 | 3168 | 57 9 54 | 3181 | 55 43 22 | 3193 |
| 29 | α Pegasi W. | 112 54 26 | 3345 | 114 17 45 | 3365 | 115 40 41 | 3387 | 117 3 12 | 3410 |
| | α Arietis W. | 71 20 59 | 2972 | 72 51 47 | 2979 | 74 22 26 | 2987 | 75 52 55 | 2993 |
| | Aldebaran W. | 40 34 26 | 2924 | 42 6 15 | 2929 | 43 37 57 | 2935 | 45 9 32 | 2941 |
| | Sun E. | 48 34 10 | 3249 | 47 8 59 | 3261 | 45 44 2 | 3272 | 44 19 18 | 3282 |
| 30 | α Arietis W. | 83 23 13 | 3097 | 84 52 52 | 3034 | 86 22 22 | 3041 | 87 51 44 | 3047 |
| | Aldebaran W. | 52 45 35 | 2969 | 54 16 26 | 2975 | 55 47 10 | 2981 | 57 17 46 | 2986 |
| | Sun E. | 37 18 45 | 3337 | 35 55 16 | 3347 | 34 31 59 | 3358 | 33 8 55 | 3370 |
| 31 | α Arietis W. | 95 16 37 | 3078 | 96 45 13 | 3085 | 98 13 41 | 3091 | 99 42 1 | 3097 |
| | Aldebaran W. | 64 49 8 | 3013 | 66 19 5 | 3018 | 67 48 56 | 3022 | 69 18 41 | 3027 |
| | Pollux W. | 20 38 13 | 3092 | 22 7 59 | 3092 | 23 37 45 | 3092 | 25 7 30 | 3095 |
| | Sun E. | 26 16 59 | 3434 | 24 55 21 | 3450 | 23 34 1 | 3467 | 22 13 1 | 3486 |

AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | Sideral Time of Semi-diameter Passing Meridian | Equation of Time, to be Subtracted from Apparent Time. | Diff. for 1 Hour. |
|------------------|-------------------|--|-------------------|---|-------------------|---------------------------|--|--|-------------------|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | Semi-diameter. | | | |
| | | ^h ^m ^s | ^s | N. [°] ['] ["] | ["] | ['] ["] | ^s | ^m ^s | ^s |
| Tues. | 1 | 10 41 23.07 | 9.074 | N. 8 18' 9.5 | -54.45 | 15 53.59 | 64.41 | 0 3.93 | 0.781 |
| Wed. | 2 | 10 45 0.71 | 9.062 | 7 56 18.6 | 54.78 | 15 53.82 | 64.36 | 0 22.80 | 0.793 |
| Thur. | 3 | 10 48 38.07 | 9.051 | 7 34 20.0 | 55.10 | 15 54.05 | 64.32 | 0 41.94 | 0.804 |
| Frid. | 4 | 10 52 15.17 | 9.040 | 7 12 13.9 | -55.40 | 15 54.29 | 64.28 | 1 1.34 | 0.815 |
| Sat. | 5 | 10 55 52.02 | 9.030 | 6 50 0.8 | 55.69 | 15 54.53 | 64.25 | 1 20.98 | 0.825 |
| SUN. | 6 | 10 59 28.63 | 9.021 | 6 27 40.9 | 55.96 | 15 54.77 | 64.22 | 1 40.87 | 0.834 |
| Mon. | 7 | 11 3 5.02 | 9.012 | 6 5 14.7 | -56.22 | 15 55.02 | 64.19 | 2 0.99 | 0.843 |
| Tues. | 8 | 11 6 41.21 | 9.004 | 5 42 42.6 | 56.46 | 15 55.27 | 64.16 | 2 21.29 | 0.851 |
| Wed. | 9 | 11 10 17.21 | 8.996 | 5 20 4.8 | 56.69 | 15 55.53 | 64.14 | 2 41.79 | 0.859 |
| Thur. | 10 | 11 13 53.03 | 8.990 | 4 57 21.7 | -56.90 | 15 55.78 | 64.12 | 3 2.46 | 0.865 |
| Frid. | 11 | 11 17 28.71 | 8.984 | 4 34 33.6 | 57.10 | 15 56.04 | 64.10 | 3 23.28 | 0.871 |
| Sat. | 12 | 11 21 4.26 | 8.979 | 4 11 40.8 | 57.28 | 15 56.30 | 64.08 | 3 44.24 | 0.876 |
| SUN. | 13 | 11 24 39.69 | 8.975 | 3 48 43.7 | -57.45 | 15 56.56 | 64.07 | 4 5.30 | 0.880 |
| Mon. | 14 | 11 28 15.03 | 8.972 | 3 25 42.7 | 57.61 | 15 56.82 | 64.06 | 4 26.45 | 0.883 |
| Tues. | 15 | 11 31 50.30 | 8.969 | 3 2 38.1 | 57.76 | 15 57.09 | 64.05 | 4 47.67 | 0.886 |
| Wed. | 16 | 11 35 25.52 | 8.968 | 2 39 30.1 | -57.89 | 15 57.35 | 64.05 | 5 8.95 | 0.887 |
| Thur. | 17 | 11 39 0.72 | 8.968 | 2 16 19.1 | 58.01 | 15 57.61 | 64.05 | 5 30.24 | 0.888 |
| Frid. | 18 | 11 42 35.92 | 8.968 | 1 53 5.4 | 58.12 | 15 57.87 | 64.05 | 5 51.54 | 0.887 |
| Sat. | 19 | 11 46 11.15 | 8.969 | 1 29 49.3 | -58.21 | 15 58.14 | 64.06 | 6 12.81 | 0.886 |
| SUN. | 20 | 11 49 46.42 | 8.972 | 1 6 31.0 | 58.29 | 15 58.40 | 64.07 | 6 34.04 | 0.883 |
| Mon. | 21 | 11 53 21.76 | 8.975 | 0 43 11.0 | 58.36 | 15 58.67 | 64.08 | 6 55.19 | 0.880 |
| Tues. | 22 | 11 56 57.20 | 8.979 | N. 0 19 49.5 | -58.42 | 15 58.93 | 64.09 | 7 16.25 | 0.876 |
| Wed. | 23 | 12 0 32.76 | 8.984 | S. 0 3 33.2 | 58.46 | 15 59.20 | 64.11 | 7 37.18 | 0.871 |
| Thur. | 24 | 12 4 8.46 | 8.991 | 0 26 56.7 | 58.49 | 15 59.46 | 64.13 | 7 57.98 | 0.864 |
| Frid. | 25 | 12 7 44.31 | 8.998 | 0 50 20.7 | -58.50 | 15 59.73 | 64.15 | 8 18.61 | 0.857 |
| Sat. | 26 | 12 11 20.35 | 9.006 | 1 13 44.9 | 58.50 | 16 0.00 | 64.17 | 8 39.07 | 0.849 |
| SUN. | 27 | 12 14 56.60 | 9.015 | 1 37 8.9 | 58.49 | 16 0.27 | 64.20 | 8 59.32 | 0.840 |
| Mon. | 28 | 12 18 33.07 | 9.025 | 2 0 32.5 | -58.46 | 16 0.54 | 64.23 | 9 19.35 | 0.830 |
| Tues. | 29 | 12 22 9.78 | 9.035 | 2 23 55.2 | 58.41 | 16 0.81 | 64.27 | 9 39.13 | 0.820 |
| Wed. | 30 | 12 25 46.75 | 9.046 | 2 47 16.7 | 58.35 | 16 1.08 | 64.31 | 9 58.66 | 0.809 |
| Thur. | 31 | 12 29 24.00 | 9.058 | S. 3 10 36.6 | -58.28 | 16 1.35 | 64.35 | 10 17.91 | 0.797 |

NOTE.—The mean time of semidiameter passing may be found by subtracting 0^s.18 from the sideral time.

The sign - prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, to be Added to Mean Time. | Diff. for 1 Hour. | Sidereal Time, or Right Ascension of Mean Sun. |
|------------------|-------------------|--|-------------------|--|-------------------|---|-------------------|--|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | | | |
| | | ^h ^m ^s | ^s | [°] ['] ["] | ["] | ^m ^s | ^s | ^h ^m ^s |
| Tues. | 1 | 10 41 23.08 | 9.076 | N. 8 18' 9.4" | -54.46 | 0 3.93 | 0.781 | 10 41 27.01 |
| Wed. | 2 | 10 45 0.76 | 9.064 | 7 56 18.2 | 54.79 | 0 22.80 | 0.793 | 10 45 23.56 |
| Thur. | 3 | 10 48 38.17 | 9.053 | 7 34 19.3 | 55.11 | 0 41.94 | 0.804 | 10 49 20.11 |
| Frid. | 4 | 10 52 15.32 | 9.042 | 7 12 12.9 | -55.41 | 1 1.35 | 0.815 | 10 53 16.67 |
| Sat. | 5 | 10 55 52.22 | 9.032 | 6 49 59.5 | 55.70 | 1 21.00 | 0.825 | 10 57 13.22 |
| SUN. | 6 | 10 59 28.88 | 9.023 | 6 27 39.3 | 55.97 | 1 40.89 | 0.834 | 11 1 9.77 |
| Mon. | 7 | 11 3 5.32 | 9.014 | 6 5 12.8 | -56.23 | 2 1.00 | 0.843 | 11 5 6.32 |
| Tues. | 8 | 11 6 41.56 | 9.006 | 5 42 40.3 | 56.47 | 2 21.32 | 0.851 | 11 9 2.88 |
| Wed. | 9 | 11 10 17.61 | 8.998 | 5 20 2.2 | 56.70 | 2 41.83 | 0.859 | 11 12 59.44 |
| Thur. | 10 | 11 13 53.48 | 8.992 | 4 57 18.8 | -56.91 | 3 2.51 | 0.865 | 11 16 55.99 |
| Frid. | 11 | 11 17 29.21 | 8.986 | 4 34 30.4 | 57.11 | 3 23.33 | 0.871 | 11 20 52.54 |
| Sat. | 12 | 11 21 4.81 | 8.981 | 4 11 37.3 | 57.30 | 3 44.29 | 0.876 | 11 24 49.10 |
| SUN. | 13 | 11 24 40.29 | 8.977 | 3 48 39.9 | -57.47 | 4 5.36 | 0.880 | 11 28 45.65 |
| Mon. | 14 | 11 28 15.69 | 8.974 | 3 25 38.5 | 57.63 | 4 26.51 | 0.883 | 11 32 42.20 |
| Tues. | 15 | 11 31 51.01 | 8.971 | 3 2 33.5 | 57.78 | 4 47.74 | 0.886 | 11 36 38.75 |
| Wed. | 16 | 11 35 26.29 | 8.970 | 2 39 25.2 | -57.91 | 5 9.02 | 0.887 | 11 40 35.31 |
| Thur. | 17 | 11 39 1.54 | 8.970 | 2 16 13.8 | 58.03 | 5 30.32 | 0.888 | 11 44 31.86 |
| Frid. | 18 | 11 42 36.79 | 8.970 | 1 52 59.7 | 58.14 | 5 51.62 | 0.887 | 11 48 28.41 |
| Sat. | 19 | 11 46 12.07 | 8.971 | 1 29 43.3 | -58.23 | 6 12.90 | 0.886 | 11 52 24.97 |
| SUN. | 20 | 11 49 47.39 | 8.974 | 1 6 24.7 | 58.31 | 6 34.13 | 0.883 | 11 56 21.52 |
| Mon. | 21 | 11 53 22.79 | 8.977 | 0 43 4.3 | 58.38 | 6 55.29 | 0.880 | 12 0 18.08 |
| Tues. | 22 | 11 56 58.28 | 8.981 | N. 0 19 42.5 | -58.44 | 7 16.35 | 0.876 | 12 4 14.63 |
| Wed. | 23 | 12 0 33.89 | 8.986 | S. 0 3 40.6 | 58.48 | 7 37.29 | 0.871 | 12 8 11.18 |
| Thur. | 24 | 12 4 9.65 | 8.993 | 0 27 4.5 | 58.51 | 7 58.09 | 0.864 | 12 12 7.74 |
| Frid. | 25 | 12 7 45.56 | 9.000 | 0 50 28.8 | -58.52 | 8 18.73 | 0.857 | 12 16 4.29 |
| Sat. | 26 | 12 11 21.65 | 9.008 | 1 13 53.3 | 58.52 | 8 39.19 | 0.849 | 12 20 0.84 |
| SUN. | 27 | 12 14 57.95 | 9.017 | 1 37 17.7 | 58.51 | 8 59.44 | 0.840 | 12 23 57.39 |
| Mon. | 28 | 12 18 34.47 | 9.027 | 2 0 41.6 | -58.48 | 9 19.47 | 0.830 | 12 27 53.94 |
| Tues. | 29 | 12 22 11.24 | 9.037 | 2 24 4.6 | 58.43 | 9 39.26 | 0.820 | 12 31 50.50 |
| Wed. | 30 | 12 25 48.26 | 9.048 | 2 47 26.4 | 58.37 | 9 58.79 | 0.809 | 12 35 47.05 |
| Thur. | 31 | 12 29 25.56 | 9.060 | S. 3 10 46.6 | -58.30 | 10 18.04 | 0.797 | 12 39 43.60 |

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

Diff. for 1 Hour,
+9.8565.
(Table III.)

| AT GREENWICH MEAN NOON. | | | | | | | | | |
|--|------------------|-----------------|------------|-------------------|----------|-----------|--|---|-----------------------------|
| Day of the Month. | Day of the Year. | THE SUN'S | | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 Hour. | Mean Time of Sidereal Noon. |
| | | TRUE LONGITUDE. | | Diff. for 1 Hour. | LATITUDE | | | | |
| | | λ | λ' | | | | | | |
| 1 | 244 | 158° 44' 2.7 | 43 43.1 | 145.31 | + 0.54 | 0.0038131 | -43.3 | ^h 13 ^m 16 ^s 22.17 | |
| 2 | 245 | 159 42 11.1 | 41 51.4 | 145.39 | 0.56 | 0.0037086 | 43.9 | 13 12 26.26 | |
| 3 | 246 | 160 40 21.3 | 40 1.5 | 145.46 | 0.55 | 0.0036024 | 44.6 | 13 8 30.36 | |
| 4 | 247 | 161 38 33.2 | 38 13.3 | 145.53 | + 0.51 | 0.0034945 | -45.2 | 13 4 34.45 | |
| 5 | 248 | 162 36 46.7 | 36 26.7 | 145.60 | 0.44 | 0.0033850 | 45.9 | 13 0 38.54 | |
| 6 | 249 | 163 35 1.9 | 34 41.8 | 145.67 | 0.34 | 0.0032740 | 46.5 | 12 56 42.63 | |
| 7 | 250 | 164 33 18.7 | 32 58.5 | 145.73 | + 0.22 | 0.0031614 | -47.2 | 12 52 46.72 | |
| 8 | 251 | 165 31 37.1 | 31 16.8 | 145.80 | + 0.08 | 0.0030475 | 47.8 | 12 48 50.82 | |
| 9 | 252 | 166 29 57.1 | 29 36.7 | 145.86 | - 0.05 | 0.0029322 | 48.3 | 12 44 54.91 | |
| 10 | 253 | 167 28 18.6 | 27 58.1 | 145.93 | - 0.18 | 0.0028158 | -48.7 | 12 40 59.00 | |
| 11 | 254 | 168 26 41.6 | 26 21.0 | 145.99 | 0.30 | 0.0026985 | 49.0 | 12 37 3.10 | |
| 12 | 255 | 169 25 6.2 | 24 45.4 | 146.06 | 0.41 | 0.0025805 | 49.3 | 12 33 7.20 | |
| 13 | 256 | 170 23 32.4 | 23 11.5 | 146.13 | - 0.51 | 0.0024618 | -49.5 | 12 29 11.29 | |
| 14 | 257 | 171 22 0.3 | 21 39.3 | 146.20 | 0.58 | 0.0023427 | 49.7 | 12 25 15.38 | |
| 15 | 258 | 172 20 29.9 | 20 8.8 | 146.27 | 0.62 | 0.0022233 | 49.8 | 12 21 19.47 | |
| 16 | 259 | 173 19 1.3 | 18 40.1 | 146.34 | - 0.63 | 0.0021036 | -49.8 | 12 17 23.56 | |
| 17 | 260 | 174 17 34.4 | 17 13.1 | 146.42 | 0.61 | 0.0019839 | 49.9 | 12 13 27.65 | |
| 18 | 261 | 175 16 9.3 | 15 47.9 | 146.49 | 0.56 | 0.0018642 | 49.9 | 12 9 31.74 | |
| 19 | 262 | 176 14 46.1 | 14 24.6 | 146.57 | - 0.48 | 0.0017444 | -49.9 | 12 5 35.84 | |
| 20 | 263 | 177 13 25.0 | 13 3.4 | 146.66 | 0.38 | 0.0016246 | 49.9 | 12 1 39.93 | |
| 21 | 264 | 178 12 6.1 | 11 44.4 | 146.75 | 0.26 | 0.0015048 | 49.9 | 11 57 44.02 | |
| 22 | 265 | 179 10 49.3 | 10 27.5 | 146.84 | - 0.13 | 0.0013850 | -49.9 | 11 53 48.11 | |
| 23 | 266 | 180 9 34.7 | 9 12.8 | 146.94 | 0.00 | 0.0012652 | 49.9 | 11 49 52.21 | |
| 24 | 267 | 181 8 22.3 | 8 0.3 | 147.03 | + 0.14 | 0.0011452 | 50.0 | 11 45 56.31 | |
| 25 | 268 | 182 7 12.1 | 6 50.0 | 147.12 | + 0.25 | 0.0010249 | -50.2 | 11 42 0.40 | |
| 26 | 269 | 183 6 4.2 | 5 42.0 | 147.21 | 0.35 | 0.0009043 | 50.4 | 11 38 4.49 | |
| 27 | 270 | 184 4 58.7 | 4 36.4 | 147.31 | 0.43 | 0.0007832 | 50.6 | 11 34 8.58 | |
| 28 | 271 | 185 3 55.5 | 3 33.1 | 147.40 | + 0.49 | 0.0006616 | -50.8 | 11 30 12.68 | |
| 29 | 272 | 186 2 54.5 | 2 32.0 | 147.50 | 0.51 | 0.0005394 | 51.1 | 11 26 16.77 | |
| 30 | 273 | 187 1 55.7 | 1 33.1 | 147.59 | 0.50 | 0.0004164 | 51.4 | 11 22 20.86 | |
| 31 | 274 | 188 0 59.1 | 0 36.4 | 147.68 | + 0.46 | 0.0002928 | -51.7 | 11 18 24.96 | |
| NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^h .0. | | | | | | | | Diff. for 1 Hour, — 9 ^m .8296. (Table II.) | |

GREENWICH MEAN TIME.

THE MOON'S

| Day of the Month. | | | | | | | | | |
|-------------------|--------------------|-----------|----------------------|----------------------|-----------|----------------------|---------------------------|----------------------|-------|
| | SEMI- DIAMETER. | | HORIZONTAL PARALLAX. | | | | UPPER TRANSIT. | | AGE. |
| | Noon. | Midnight. | Noon. | Diff. for 1 Hour. | Midnight. | Diff. for 1 Hour. | Meridian of Greenwich. | Diff. for 1 Hour. | Noon. |
| 1 | 14' 51.5 | 14' 49.3 | 54' 25.0 | -0.73 | 54' 16.9 | -0.62 | 23 31.1 | 1.82 | 27.8 |
| 2 | 14 47.4 | 14 45.9 | 54 10.1 | 0.52 | 54 4.6 | 0.41 | δ | | 28.8 |
| 3 | 14 44.8 | 14 44.0 | 54 0.4 | 0.30 | 53 57.5 | -0.19 | 0 13.6 | 1.73 | 0.2 |
| 4 | 14 43.6 | 14 43.5 | 53 55.9 | -0.08 | 53 55.7 | +0.05 | 0 54.3 | 1.67 | 1.2 |
| 5 | 14 43.9 | 14 44.6 | 53 57.0 | +0.18 | 53 59.8 | 0.31 | 1 34.0 | 1.65 | 2.2 |
| 6 | 14 45.8 | 14 47.6 | 54 4.3 | 0.46 | 54 10.6 | 0.60 | 2 13.6 | 1.66 | 3.2 |
| 7 | 14 49.7 | 14 52.5 | 54 18.6 | +0.76 | 54 28.6 | +0.92 | 2 54.0 | 1.72 | 4.2 |
| 8 | 14 55.7 | 14 59.5 | 54 40.6 | 1.09 | 54 54.6 | 1.26 | 3 36.4 | 1.82 | 5.2 |
| 9 | 15 3.9 | 15 8.9 | 55 10.7 | 1.44 | 55 29.0 | 1.62 | 4 21.6 | 1.96 | 6.2 |
| 10 | 15 14.5 | 15 20.5 | 55 49.4 | +1.79 | 56 11.7 | +1.94 | 5 10.4 | 2.12 | 7.2 |
| 11 | 15 27.1 | 15 34.1 | 56 35.9 | 2.09 | 57 1.7 | 2.21 | 6 3.3 | 2.28 | 8.2 |
| 12 | 15 41.5 | 15 49.2 | 57 28.9 | 2.31 | 57 57.1 | 2.38 | 7 0.0 | 2.42 | 9.2 |
| 13 | 15 57.1 | 16 4.9 | 58 25.9 | +2.40 | 58 54.6 | +2.38 | 7 59.3 | 2.49 | 10.2 |
| 14 | 16 12.6 | 16 19.9 | 59 22.8 | 2.30 | 59 49.8 | 2.17 | 8 59.4 | 2.48 | 11.2 |
| 15 | 16 26.7 | 16 32.8 | 60 14.8 | 1.98 | 60 37.2 | 1.73 | 9 58.5 | 2.42 | 12.2 |
| 16 | 16 38.0 | 16 42.0 | 60 56.1 | +1.41 | 61 10.9 | +1.06 | 10 55.5 | 2.33 | 13.2 |
| 17 | 16 44.8 | 16 46.3 | 61 21.3 | +0.66 | 61 26.6 | +0.24 | 11 50.2 | 2.25 | 14.2 |
| 18 | 16 46.3 | 16 45.0 | 61 26.9 | -0.20 | 61 22.0 | -0.62 | 12 43.3 | 2.19 | 15.2 |
| 19 | 16 42.3 | 16 38.4 | 61 12.1 | -1.02 | 60 57.7 | -1.38 | 13 35.6 | 2.19 | 16.2 |
| 20 | 16 33.4 | 16 27.4 | 60 39.2 | 1.69 | 60 17.3 | 1.95 | 14 28.3 | 2.22 | 17.2 |
| 21 | 16 20.7 | 16 13.4 | 59 52.6 | 2.14 | 59 26.0 | 2.28 | 15 22.0 | 2.26 | 18.2 |
| 22 | 16 5.8 | 15 58.0 | 58 58.0 | -2.36 | 58 29.4 | -2.39 | 16 17.0 | 2.31 | 19.2 |
| 23 | 15 50.2 | 15 42.6 | 58 0.8 | 2.36 | 57 32.8 | 2.30 | 17 12.9 | 2.33 | 20.2 |
| 24 | 15 35.2 | 15 28.2 | 57 5.7 | 2.21 | 56 39.9 | 2.09 | 18 8.8 | 2.30 | 21.2 |
| 25 | 15 21.6 | 15 15.5 | 56 15.7 | -1.94 | 55 53.4 | -1.79 | 19 3.2 | 2.22 | 22.2 |
| 26 | 15 10.0 | 15 5.0 | 55 33.0 | 1.62 | 55 14.6 | 1.46 | 19 55.2 | 2.10 | 23.2 |
| 27 | 15 0.5 | 14 56.6 | 54 58.2 | 1.28 | 54 43.9 | 1.11 | 20 44.1 | 1.97 | 24.2 |
| 28 | 14 53.3 | 14 50.5 | 54 31.7 | -0.94 | 54 21.4 | -0.79 | 21 29.8 | 1.85 | 25.2 |
| 29 | 14 48.2 | 14 46.4 | 54 12.9 | 0.63 | 54 6.3 | 0.49 | 22 12.8 | 1.75 | 26.2 |
| 30 | 14 45.0 | 14 44.1 | 54 1.3 | 0.35 | 53 57.9 | -0.22 | 22 53.8 | 1.68 | 27.2 |
| 31 | 14 43.6 | 14 43.5 | 53 56.1 | -0.10 | 53 55.7 | +0.03 | 23 33.7 | 1.65 | 28.2 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|------------------|---------------------|-------------|------------------|---------------------|------------------|---------------------|
| TUESDAY 1. | | | | | THURSDAY 3. | | | | |
| 0 | 9 29 49.44 | 2.0343 | N. 19° 58' 5.0" | 9.615 | 0 | 11 2 34.62 | 1.8443 | N. 11° 25' 37.8" | 11.996 |
| 1 | 9 31 51.36 | 2.0397 | 19 49 1.6 | 9.099 | 1 | 11 4 25.19 | 1.8414 | 11 13 36.8 | 12.037 |
| 2 | 9 33 53.00 | 2.0450 | 19 39 53.2 | 9.182 | 2 | 11 6 15.59 | 1.8385 | 11 1 33.4 | 12.077 |
| 3 | 9 35 54.36 | 2.0503 | 19 30 39.8 | 9.264 | 3 | 11 8 5.81 | 1.8357 | 10 49 27.6 | 12.116 |
| 4 | 9 37 55.44 | 2.0157 | 19 21 21.5 | 9.344 | 4 | 11 9 55.87 | 1.8329 | 10 37 19.5 | 12.154 |
| 5 | 9 39 56.25 | 2.0112 | 19 11 58.5 | 9.423 | 5 | 11 11 45.76 | 1.8302 | 10 25 9.1 | 12.192 |
| 6 | 9 41 56.78 | 2.0066 | 19 2 30.8 | 9.501 | 6 | 11 13 35.49 | 1.8275 | 10 12 56.4 | 12.230 |
| 7 | 9 43 57.04 | 2.0020 | 18 52 58.4 | 9.579 | 7 | 11 15 25.06 | 1.8248 | 10 0 41.5 | 12.268 |
| 8 | 9 45 57.02 | 1.9974 | 18 43 21.3 | 9.657 | 8 | 11 17 14.47 | 1.8222 | 9 48 24.5 | 12.301 |
| 9 | 9 47 56.73 | 1.9929 | 18 33 39.6 | 9.733 | 9 | 11 19 3.73 | 1.8197 | 9 36 5.4 | 12.336 |
| 10 | 9 49 56.17 | 1.9885 | 18 23 53.4 | 9.808 | 10 | 11 20 52.84 | 1.8173 | 9 23 44.2 | 12.370 |
| 11 | 9 51 55.35 | 1.9841 | 18 14 2.7 | 9.882 | 11 | 11 22 41.81 | 1.8149 | 9 11 21.0 | 12.402 |
| 12 | 9 53 54.26 | 1.9796 | 18 4 7.6 | 9.955 | 12 | 11 24 30.63 | 1.8125 | 8 58 55.9 | 12.434 |
| 13 | 9 55 52.90 | 1.9752 | 17 54 8.1 | 10.027 | 13 | 11 26 19.31 | 1.8102 | 8 46 28.9 | 12.466 |
| 14 | 9 57 51.28 | 1.9708 | 17 44 4.3 | 10.098 | 14 | 11 28 7.86 | 1.8080 | 8 34 0.0 | 12.497 |
| 15 | 9 59 49.40 | 1.9665 | 17 33 56.3 | 10.168 | 15 | 11 29 56.27 | 1.8058 | 8 21 29.2 | 12.527 |
| 16 | 10 1 47.26 | 1.9622 | 17 23 44.1 | 10.238 | 16 | 11 31 44.55 | 1.8036 | 8 8 56.7 | 12.556 |
| 17 | 10 3 44.86 | 1.9579 | 17 13 27.7 | 10.307 | 17 | 11 33 32.70 | 1.8015 | 7 56 22.5 | 12.584 |
| 18 | 10 5 42.21 | 1.9537 | 17 3 7.3 | 10.374 | 18 | 11 35 20.73 | 1.7995 | 7 43 46.6 | 12.611 |
| 19 | 10 7 39.30 | 1.9494 | 16 52 42.8 | 10.441 | 19 | 11 37 8.64 | 1.7975 | 7 31 9.1 | 12.638 |
| 20 | 10 9 36.14 | 1.9452 | 16 42 14.3 | 10.506 | 20 | 11 38 56.43 | 1.7956 | 7 18 30.0 | 12.665 |
| 21 | 10 11 32.73 | 1.9411 | 16 31 42.0 | 10.571 | 21 | 11 40 44.11 | 1.7937 | 7 5 49.3 | 12.691 |
| 22 | 10 13 29.07 | 1.9369 | 16 21 5.8 | 10.636 | 22 | 11 42 31.68 | 1.7919 | 6 53 7.1 | 12.715 |
| 23 | 10 15 25.16 | 1.9328 | N. 16° 10' 25.7" | 10.699 | 23 | 11 44 19.14 | 1.7902 | N. 6° 40' 23.5" | 12.739 |
| WEDNESDAY 2. | | | | | FRIDAY 4. | | | | |
| 0 | 10 17 21.01 | 1.9288 | N. 15° 59' 41.9" | 10.761 | 0 | 11 46 6.50 | 1.7885 | N. 6° 27' 38.4" | 12.762 |
| 1 | 10 19 16.62 | 1.9248 | 15 48 54.4 | 10.822 | 1 | 11 47 53.76 | 1.7868 | 6 14 52.0 | 12.784 |
| 2 | 10 21 11.99 | 1.9208 | 15 38 3.2 | 10.883 | 2 | 11 49 40.92 | 1.7852 | 6 2 4.3 | 12.806 |
| 3 | 10 23 7.12 | 1.9169 | 15 27 8.4 | 10.943 | 3 | 11 51 27.99 | 1.7837 | 5 49 15.3 | 12.827 |
| 4 | 10 25 2.02 | 1.9131 | 15 16 10.1 | 11.002 | 4 | 11 53 14.97 | 1.7823 | 5 36 25.0 | 12.847 |
| 5 | 10 26 56.69 | 1.9092 | 15 5 8.2 | 11.060 | 5 | 11 55 1.87 | 1.7809 | 5 23 33.6 | 12.866 |
| 6 | 10 28 51.12 | 1.9054 | 14 54 2.9 | 11.117 | 6 | 11 56 48.68 | 1.7795 | 5 10 41.1 | 12.884 |
| 7 | 10 30 45.33 | 1.9016 | 14 42 54.2 | 11.172 | 7 | 11 58 35.41 | 1.7782 | 4 57 47.5 | 12.902 |
| 8 | 10 32 39.31 | 1.8978 | 14 31 42.2 | 11.227 | 8 | 12 0 22.07 | 1.7770 | 4 44 52.8 | 12.920 |
| 9 | 10 34 33.07 | 1.8942 | 14 20 26.9 | 11.282 | 9 | 12 2 8.65 | 1.7758 | 4 31 57.1 | 12.937 |
| 10 | 10 36 26.61 | 1.8906 | 14 9 8.3 | 11.336 | 10 | 12 3 55.17 | 1.7747 | 4 19 0.4 | 12.952 |
| 11 | 10 38 19.94 | 1.8870 | 13 57 46.6 | 11.388 | 11 | 12 5 41.62 | 1.7737 | 4 6 2.8 | 12.967 |
| 12 | 10 40 13.05 | 1.8834 | 13 46 21.8 | 11.439 | 12 | 12 7 28.01 | 1.7727 | 3 53 4.3 | 12.982 |
| 13 | 10 42 5.95 | 1.8799 | 13 34 53.9 | 11.490 | 13 | 12 9 14.34 | 1.7717 | 3 40 5.0 | 12.995 |
| 14 | 10 43 58.64 | 1.8764 | 13 23 23.0 | 11.540 | 14 | 12 11 0.62 | 1.7709 | 3 27 4.9 | 13.008 |
| 15 | 10 45 51.12 | 1.8730 | 13 11 49.1 | 11.590 | 15 | 12 12 46.85 | 1.7701 | 3 14 4.0 | 13.021 |
| 16 | 10 47 43.40 | 1.8697 | 13 0 12.2 | 11.639 | 16 | 12 14 33.03 | 1.7693 | 3 1 2.4 | 13.032 |
| 17 | 10 49 35.48 | 1.8663 | 12 48 32.4 | 11.686 | 17 | 12 16 19.17 | 1.7686 | 2 48 0.2 | 13.043 |
| 18 | 10 51 27.35 | 1.8629 | 12 36 49.8 | 11.732 | 18 | 12 18 5.26 | 1.7679 | 2 34 57.3 | 13.053 |
| 19 | 10 53 19.03 | 1.8597 | 12 25 4.5 | 11.778 | 19 | 12 19 51.32 | 1.7674 | 2 21 53.8 | 13.062 |
| 20 | 10 55 10.52 | 1.8566 | 12 13 16.4 | 11.824 | 20 | 12 21 37.35 | 1.7669 | 2 8 49.8 | 13.070 |
| 21 | 10 57 1.82 | 1.8535 | 12 1 25.6 | 11.868 | 21 | 12 23 23.35 | 1.7664 | 1 55 45.4 | 13.078 |
| 22 | 10 58 52.94 | 1.8504 | 11 49 32.2 | 11.911 | 22 | 12 25 9.32 | 1.7660 | 1 42 40.5 | 13.086 |
| 23 | 11 0 43.87 | 1.8473 | 11 37 36.3 | 11.954 | 23 | 12 26 55.27 | 1.7657 | 1 29 35.1 | 13.093 |
| 24 | 11 2 34.62 | 1.8443 | N. 11° 25' 37.8" | 11.996 | 24 | 12 28 41.21 | 1.7655 | N. 1° 16' 29.3" | 13.099 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|---------------------|--------------|---------------------|------------|------------------|---------------------|---------------|---------------------|
| SATURDAY 5. | | | | | MONDAY 7. | | | | |
| 0 | 12 28 41.21 | 1.7655 | N. 16 29.3 | 13.099 | 0 | 13 54 18.58 | 1.8266 | S. 9 5 31.7 | 12.544 |
| 1 | 12 30 27.13 | 1.7653 | 1 3 23.2 | 13.103 | 1 | 13 56 8.26 | 1.8264 | 9 18 3.5 | 12.515 |
| 2 | 12 32 13.04 | 1.7651 | 0 50 16.9 | 13.107 | 2 | 13 57 58.11 | 1.8262 | 9 30 33.5 | 12.484 |
| 3 | 12 33 58.95 | 1.7651 | 0 37 10.3 | 13.111 | 3 | 13 59 48.13 | 1.8259 | 9 43 1.6 | 12.453 |
| 4 | 12 35 44.85 | 1.7650 | 0 24 3.5 | 13.114 | 4 | 14 1 38.34 | 1.8263 | 9 55 27.8 | 12.421 |
| 5 | 12 37 30.75 | 1.7651 | N. 0 10 56.6 | 13.117 | 5 | 14 3 28.73 | 1.8414 | 10 7 52.1 | 12.388 |
| 6 | 12 39 16.66 | 1.7652 | S. 0 2 10.5 | 13.118 | 6 | 14 5 19.31 | 1.8446 | 10 20 14.4 | 12.355 |
| 7 | 12 41 2.57 | 1.7653 | 0 15 17.6 | 13.119 | 7 | 14 7 10.08 | 1.8478 | 10 32 34.7 | 12.321 |
| 8 | 12 42 48.50 | 1.7656 | 0 28 24.8 | 13.120 | 8 | 14 9 1.05 | 1.8511 | 10 44 52.9 | 12.286 |
| 9 | 12 44 34.44 | 1.7659 | 0 41 32.0 | 13.119 | 9 | 14 10 52.21 | 1.8544 | 10 57 9.0 | 12.251 |
| 10 | 12 46 20.40 | 1.7662 | 0 54 39.1 | 13.118 | 10 | 14 12 43.58 | 1.8578 | 11 9 23.0 | 12.214 |
| 11 | 12 48 6.38 | 1.7666 | 1 7 46.1 | 13.116 | 11 | 14 14 35.15 | 1.8612 | 11 21 34.7 | 12.176 |
| 12 | 12 49 52.30 | 1.7671 | 1 20 53.0 | 13.113 | 12 | 14 16 26.93 | 1.8646 | 11 33 44.1 | 12.137 |
| 13 | 12 51 38.43 | 1.7677 | 1 33 59.7 | 13.110 | 13 | 14 18 18.93 | 1.8685 | 11 45 51.2 | 12.096 |
| 14 | 12 53 24.51 | 1.7682 | 1 47 6.2 | 13.106 | 14 | 14 20 11.15 | 1.8721 | 11 57 55.9 | 12.059 |
| 15 | 12 55 10.62 | 1.7688 | 2 0 12.4 | 13.101 | 15 | 14 22 3.58 | 1.8758 | 12 9 58.3 | 12.019 |
| 16 | 12 56 56.77 | 1.7696 | 2 13 18.3 | 13.096 | 16 | 14 23 56.24 | 1.8797 | 12 21 58.2 | 11.977 |
| 17 | 12 58 42.97 | 1.7704 | 2 26 23.9 | 13.090 | 17 | 14 25 49.14 | 1.8836 | 12 33 55.5 | 11.934 |
| 18 | 13 0 29.22 | 1.7712 | 2 39 29.1 | 13.083 | 18 | 14 27 42.27 | 1.8874 | 12 45 50.2 | 11.890 |
| 19 | 13 2 15.52 | 1.7722 | 2 52 33.9 | 13.076 | 19 | 14 29 35.63 | 1.8914 | 12 57 42.3 | 11.847 |
| 20 | 13 4 1.88 | 1.7732 | 3 5 38.2 | 13.067 | 20 | 14 31 29.24 | 1.8955 | 13 9 31.8 | 11.802 |
| 21 | 13 5 48.30 | 1.7743 | 3 18 41.9 | 13.057 | 21 | 14 33 23.09 | 1.8996 | 13 21 18.5 | 11.755 |
| 22 | 13 7 34.79 | 1.7754 | 3 31 45.0 | 13.048 | 22 | 14 35 17.19 | 1.9037 | 13 33 2.4 | 11.708 |
| 23 | 13 9 21.35 | 1.7765 | S. 3 44 47.6 | 13.038 | 23 | 14 37 11.54 | 1.9079 | S. 13 44 43.5 | 11.661 |
| SUNDAY 6. | | | | | TUESDAY 8. | | | | |
| 0 | 13 11 7.97 | 1.7777 | S. 3 57 49.6 | 13.027 | 0 | 14 39 6.14 | 1.9122 | S. 13 56 21.8 | 11.613 |
| 1 | 13 12 54.67 | 1.7790 | 4 10 50.9 | 13.015 | 1 | 14 41 1.00 | 1.9165 | 14 7 57.1 | 11.563 |
| 2 | 13 14 41.45 | 1.7804 | 4 23 51.4 | 13.003 | 2 | 14 42 56.12 | 1.9209 | 14 19 29.4 | 11.513 |
| 3 | 13 16 28.32 | 1.7819 | 4 36 51.2 | 12.990 | 3 | 14 44 51.51 | 1.9254 | 14 30 58.7 | 11.463 |
| 4 | 13 18 15.28 | 1.7833 | 4 49 50.2 | 12.976 | 4 | 14 46 47.17 | 1.9299 | 14 42 24.9 | 11.410 |
| 5 | 13 20 2.32 | 1.7848 | 5 2 48.3 | 12.961 | 5 | 14 48 43.10 | 1.9345 | 14 53 47.9 | 11.356 |
| 6 | 13 21 49.45 | 1.7863 | 5 15 45.5 | 12.946 | 6 | 14 50 39.31 | 1.9392 | 15 5 7.6 | 11.302 |
| 7 | 13 23 36.68 | 1.7881 | 5 28 41.8 | 12.930 | 7 | 14 52 35.80 | 1.9439 | 15 16 24.1 | 11.247 |
| 8 | 13 25 24.02 | 1.7899 | 5 41 37.1 | 12.913 | 8 | 14 54 32.57 | 1.9486 | 15 27 37.3 | 11.192 |
| 9 | 13 27 11.47 | 1.7917 | 5 54 31.3 | 12.895 | 9 | 14 56 29.63 | 1.9534 | 15 38 47.1 | 11.135 |
| 10 | 13 28 59.03 | 1.7936 | 6 7 24.5 | 12.877 | 10 | 14 58 26.98 | 1.9582 | 15 49 53.5 | 11.077 |
| 11 | 13 30 46.70 | 1.7955 | 6 20 16.6 | 12.858 | 11 | 15 0 24.62 | 1.9631 | 16 0 56.4 | 11.018 |
| 12 | 13 32 34.49 | 1.7975 | 6 33 7.5 | 12.838 | 12 | 15 2 22.55 | 1.9680 | 16 11 55.7 | 10.958 |
| 13 | 13 34 22.40 | 1.7996 | 6 45 57.2 | 12.818 | 13 | 15 4 20.78 | 1.9731 | 16 22 51.4 | 10.898 |
| 14 | 13 36 10.44 | 1.8017 | 6 58 45.6 | 12.797 | 14 | 15 6 19.32 | 1.9782 | 16 33 43.5 | 10.836 |
| 15 | 13 37 58.60 | 1.8039 | 7 11 32.8 | 12.776 | 15 | 15 8 18.17 | 1.9834 | 16 44 31.8 | 10.773 |
| 16 | 13 39 46.90 | 1.8062 | 7 24 18.7 | 12.752 | 16 | 15 10 17.33 | 1.9886 | 16 55 16.3 | 10.710 |
| 17 | 13 41 35.34 | 1.8085 | 7 37 3.1 | 12.728 | 17 | 15 12 16.80 | 1.9938 | 17 5 57.0 | 10.647 |
| 18 | 13 43 23.92 | 1.8109 | 7 49 46.1 | 12.704 | 18 | 15 14 16.59 | 1.9991 | 17 16 33.9 | 10.582 |
| 19 | 13 45 12.65 | 1.8133 | 8 2 27.6 | 12.679 | 19 | 15 16 16.70 | 2.0045 | 17 27 6.8 | 10.514 |
| 20 | 13 47 1.52 | 1.8158 | 8 15 7.6 | 12.654 | 20 | 15 18 17.13 | 2.0098 | 17 37 35.6 | 10.446 |
| 21 | 13 48 50.54 | 1.8184 | 8 27 46.1 | 12.628 | 21 | 15 20 17.88 | 2.0152 | 17 48 0.3 | 10.377 |
| 22 | 13 50 39.72 | 1.8211 | 8 40 23.0 | 12.601 | 22 | 15 22 18.96 | 2.0207 | 17 58 20.9 | 10.308 |
| 23 | 13 52 29.07 | 1.8238 | 8 52 58.2 | 12.573 | 23 | 15 24 20.37 | 2.0263 | 18 8 37.3 | 10.237 |
| 24 | 13 54 18.58 | 1.8266 | S. 9 5 31.7 | 12.544 | 24 | 15 26 22.12 | 2.0319 | S. 18 18 49.4 | 10.166 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|------------------|---------------------|--------------|------------------|---------------------|------------------|---------------------|
| WEDNESDAY 9. | | | | | FRIDAY 11. | | | | |
| 0 | 15 26 22.12 | 2.0319 | S. 18° 18' 49.4" | 10.166 | 0 | 17 10 57.30 | 2.3319 | S. 24° 42' 49.6" | 5.361 |
| 1 | 15 28 24.20 | 2.0375 | 18 28 57.2 | 10.083 | 1 | 17 13 17.36 | 2.3374 | 24 48 8.6 | 5.369 |
| 2 | 15 30 26.62 | 2.0432 | 18 39 0.6 | 10.019 | 2 | 17 15 37.79 | 2.3437 | 24 53 19.8 | 5.192 |
| 3 | 15 32 29.39 | 2.0490 | 18 48 59.5 | 9.944 | 3 | 17 17 58.60 | 2.3499 | 24 58 23.2 | 4.991 |
| 4 | 15 34 32.50 | 2.0548 | 18 58 53.8 | 9.868 | 4 | 17 20 19.78 | 2.3559 | 25 3 18.7 | 4.856 |
| 5 | 15 36 35.96 | 2.0606 | 19 8 43.6 | 9.792 | 5 | 17 22 41.31 | 2.3618 | 25 8 6.2 | 4.794 |
| 6 | 15 38 39.77 | 2.0664 | 19 18 28.8 | 9.714 | 6 | 17 25 3.20 | 2.3678 | 25 12 45.6 | 4.588 |
| 7 | 15 40 43.93 | 2.0723 | 19 28 9.3 | 9.634 | 7 | 17 27 25.45 | 2.3738 | 25 17 16.8 | 4.459 |
| 8 | 15 42 48.45 | 2.0782 | 19 37 44.9 | 9.553 | 8 | 17 29 48.06 | 2.3798 | 25 21 39.9 | 4.316 |
| 9 | 15 44 53.32 | 2.0842 | 19 47 15.6 | 9.471 | 9 | 17 32 11.03 | 2.3857 | 25 25 54.7 | 4.177 |
| 10 | 15 46 58.55 | 2.0902 | 19 56 41.4 | 9.389 | 10 | 17 34 34.35 | 2.3915 | 25 30 1.1 | 4.037 |
| 11 | 15 49 4.14 | 2.0962 | 20 6 2.3 | 9.306 | 11 | 17 36 58.01 | 2.3973 | 25 33 59.1 | 3.897 |
| 12 | 15 51 10.10 | 2.1023 | 20 15 18.1 | 9.221 | 12 | 17 39 22.02 | 2.4030 | 25 37 48.7 | 3.755 |
| 13 | 15 53 16.42 | 2.1084 | 20 24 28.8 | 9.135 | 13 | 17 41 46.37 | 2.4086 | 25 41 29.7 | 3.619 |
| 14 | 15 55 23.11 | 2.1146 | 20 33 34.3 | 9.048 | 14 | 17 44 11.05 | 2.4142 | 25 45 2.1 | 3.467 |
| 15 | 15 57 30.17 | 2.1207 | 20 42 34.6 | 8.960 | 15 | 17 46 36.07 | 2.4197 | 25 48 25.8 | 3.322 |
| 16 | 15 59 37.60 | 2.1269 | 20 51 29.5 | 8.870 | 16 | 17 49 1.41 | 2.4251 | 25 51 40.7 | 3.175 |
| 17 | 16 1 45.40 | 2.1332 | 21 0 19.0 | 8.780 | 17 | 17 51 27.08 | 2.4305 | 25 54 46.8 | 3.028 |
| 18 | 16 3 53.58 | 2.1395 | 21 9 3.1 | 8.688 | 18 | 17 53 53.07 | 2.4358 | 25 57 44.1 | 2.880 |
| 19 | 16 6 2.14 | 2.1457 | 21 17 41.6 | 8.595 | 19 | 17 56 19.38 | 2.4410 | 26 0 32.4 | 2.730 |
| 20 | 16 8 11.07 | 2.1520 | 21 26 14.5 | 8.502 | 20 | 17 58 45.99 | 2.4461 | 26 3 11.7 | 2.579 |
| 21 | 16 10 20.38 | 2.1583 | 21 34 41.8 | 8.407 | 21 | 18 1 12.91 | 2.4513 | 26 5 41.9 | 2.427 |
| 22 | 16 12 30.07 | 2.1647 | 21 43 3.3 | 8.310 | 22 | 18 3 40.13 | 2.4569 | 26 8 3.0 | 2.275 |
| 23 | 16 14 40.14 | 2.1711 | S. 21° 51' 19.0" | 8.212 | 23 | 18 6 7.65 | 2.4619 | S. 26° 10' 14.9" | 2.122 |
| THURSDAY 10. | | | | | SATURDAY 12. | | | | |
| 0 | 16 16 50.60 | 2.1775 | S. 21° 59' 28.8" | 8.113 | 0 | 18 8 35.47 | 2.4660 | S. 26° 12' 17.6" | 1.967 |
| 1 | 16 19 1.44 | 2.1838 | 22 7 32.6 | 8.013 | 1 | 18 11 3.57 | 2.4707 | 26 14 10.9 | 1.811 |
| 2 | 16 21 12.66 | 2.1902 | 22 15 30.4 | 7.912 | 2 | 18 13 31.95 | 2.4753 | 26 15 54.9 | 1.655 |
| 3 | 16 23 24.27 | 2.1967 | 22 23 22.1 | 7.810 | 3 | 18 16 0.61 | 2.4799 | 26 17 29.5 | 1.497 |
| 4 | 16 25 36.26 | 2.2031 | 22 31 7.6 | 7.707 | 4 | 18 18 29.54 | 2.4844 | 26 18 54.6 | 1.339 |
| 5 | 16 27 48.64 | 2.2096 | 22 38 46.9 | 7.603 | 5 | 18 20 58.74 | 2.4887 | 26 20 10.2 | 1.180 |
| 6 | 16 30 1.41 | 2.2161 | 22 46 19.9 | 7.497 | 6 | 18 23 28.19 | 2.4930 | 26 21 16.2 | 1.019 |
| 7 | 16 32 14.57 | 2.2225 | 22 53 46.5 | 7.389 | 7 | 18 25 57.90 | 2.4972 | 26 22 12.5 | 0.858 |
| 8 | 16 34 28.11 | 2.2289 | 23 1 6.6 | 7.281 | 8 | 18 28 27.86 | 2.5013 | 26 22 59.2 | 0.697 |
| 9 | 16 36 42.04 | 2.2354 | 23 8 20.2 | 7.172 | 9 | 18 30 58.06 | 2.5052 | 26 23 36.2 | 0.535 |
| 10 | 16 38 56.36 | 2.2419 | 23 15 27.2 | 7.061 | 10 | 18 33 28.49 | 2.5090 | 26 24 3.4 | 0.372 |
| 11 | 16 41 11.07 | 2.2483 | 23 22 27.5 | 6.948 | 11 | 18 35 59.14 | 2.5127 | 26 24 20.8 | 0.207 |
| 12 | 16 43 26.16 | 2.2547 | 23 29 21.0 | 6.835 | 12 | 18 38 30.01 | 2.5163 | 26 24 28.3 | - 0.042 |
| 13 | 16 45 41.64 | 2.2612 | 23 36 7.7 | 6.721 | 13 | 18 41 1.10 | 2.5199 | 26 24 25.9 | + 0.123 |
| 14 | 16 47 57.51 | 2.2677 | 23 42 47.5 | 6.605 | 14 | 18 43 32.40 | 2.5234 | 26 24 13.5 | 0.289 |
| 15 | 16 50 13.76 | 2.2741 | 23 49 20.3 | 6.488 | 15 | 18 46 3.91 | 2.5267 | 26 23 51.2 | 0.456 |
| 16 | 16 52 30.40 | 2.2806 | 23 55 46.0 | 6.370 | 16 | 18 48 35.61 | 2.5299 | 26 23 18.8 | 0.624 |
| 17 | 16 54 47.43 | 2.2870 | 24 2 4.7 | 6.252 | 17 | 18 51 7.50 | 2.5331 | 26 22 36.3 | 0.792 |
| 18 | 16 57 4.84 | 2.2933 | 24 8 16.2 | 6.131 | 18 | 18 53 39.58 | 2.5361 | 26 21 43.7 | 0.961 |
| 19 | 16 59 22.63 | 2.2997 | 24 14 20.4 | 6.008 | 19 | 18 56 11.83 | 2.5389 | 26 20 41.0 | 1.130 |
| 20 | 17 1 40.81 | 2.3061 | 24 20 17.2 | 5.885 | 20 | 18 58 44.25 | 2.5416 | 26 19 28.1 | 1.300 |
| 21 | 17 3 59.37 | 2.3124 | 24 26 6.6 | 5.761 | 21 | 19 1 16.82 | 2.5442 | 26 18 5.0 | 1.470 |
| 22 | 17 6 18.30 | 2.3187 | 24 31 48.5 | 5.636 | 22 | 19 3 49.55 | 2.5467 | 26 16 31.7 | 1.641 |
| 23 | 17 8 37.61 | 2.3250 | 24 37 22.9 | 5.509 | 23 | 19 6 22.43 | 2.5491 | 26 14 48.1 | 1.819 |
| 24 | 17 10 57.30 | 2.3312 | S. 24° 42' 49.6" | 5.381 | 24 | 19 8 55.44 | 2.5513 | S. 26° 12' 54.3" | 1.982 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|------------|------------------|---------------------|---------------|---------------------|---------------|------------------|---------------------|---------------|---------------------|
| SUNDAY 13. | | | | | TUESDAY 15. | | | | |
| 0 | 19 8 55.44 | 2.5513 | S. 26 12 54.3 | 1.982 | 0 | 21 11 43.60 | 2.5541 | S. 21 19 33.8 | 10.090 |
| 1 | 19 11 28.58 | 2.5534 | 26 10 50.2 | 2.155 | 1 | 21 14 14.96 | 2.5512 | 21 9 23.8 | 10.949 |
| 2 | 19 14 1.85 | 2.5555 | 26 8 35.7 | 2.398 | 2 | 21 16 46.14 | 2.5493 | 20 59 4.7 | 10.394 |
| 3 | 19 16 35.25 | 2.5575 | 26 6 10.8 | 2.501 | 3 | 21 19 17.14 | 2.5459 | 20 48 36.5 | 10.545 |
| 4 | 19 19 8.75 | 2.5599 | 26 3 35.5 | 2.674 | 4 | 21 21 47.96 | 2.5431 | 20 37 59.3 | 10.694 |
| 5 | 19 21 42.35 | 2.5607 | 26 0 40.9 | 2.847 | 5 | 21 24 18.59 | 2.5090 | 20 27 13.2 | 10.842 |
| 6 | 19 24 16.04 | 2.5623 | 25 57 53.9 | 3.090 | 6 | 21 26 49.04 | 2.5058 | 20 16 18.3 | 10.982 |
| 7 | 19 26 49.82 | 2.5637 | 25 54 47.5 | 3.194 | 7 | 21 29 19.29 | 2.5026 | 20 5 14.6 | 11.134 |
| 8 | 19 29 23.68 | 2.5650 | 25 51 30.6 | 3.368 | 8 | 21 31 49.35 | 2.4994 | 19 54 2.2 | 11.377 |
| 9 | 19 31 57.62 | 2.5662 | 25 48 3.3 | 3.542 | 9 | 21 34 19.22 | 2.4962 | 19 42 41.3 | 11.419 |
| 10 | 19 34 31.63 | 2.5672 | 25 44 25.5 | 3.717 | 10 | 21 36 48.89 | 2.4928 | 19 31 11.9 | 11.561 |
| 11 | 19 37 5.69 | 2.5681 | 25 40 37.3 | 3.891 | 11 | 21 39 18.35 | 2.4893 | 19 19 34.0 | 11.701 |
| 12 | 19 39 39.80 | 2.5688 | 25 36 38.6 | 4.065 | 12 | 21 41 47.61 | 2.4859 | 19 7 47.8 | 11.839 |
| 13 | 19 42 13.95 | 2.5695 | 25 32 29.5 | 4.239 | 13 | 21 44 16.66 | 2.4825 | 18 55 53.3 | 11.976 |
| 14 | 19 44 48.14 | 2.5701 | 25 28 9.9 | 4.414 | 14 | 21 46 45.51 | 2.4791 | 18 43 50.7 | 12.111 |
| 15 | 19 47 22.36 | 2.5705 | 25 23 39.8 | 4.588 | 15 | 21 49 14.15 | 2.4756 | 18 31 40.0 | 12.245 |
| 16 | 19 49 56.60 | 2.5708 | 25 18 59.3 | 4.763 | 16 | 21 51 42.58 | 2.4720 | 18 19 21.3 | 12.377 |
| 17 | 19 52 30.86 | 2.5710 | 25 14 8.3 | 4.937 | 17 | 21 54 10.79 | 2.4684 | 18 6 54.7 | 12.507 |
| 18 | 19 55 5.12 | 2.5710 | 25 9 6.9 | 5.110 | 18 | 21 56 38.79 | 2.4648 | 17 54 20.4 | 12.636 |
| 19 | 19 57 39.38 | 2.5710 | 25 3 55.1 | 5.283 | 19 | 21 59 6.57 | 2.4613 | 17 41 38.4 | 12.764 |
| 20 | 20 0 13.64 | 2.5708 | 24 58 32.9 | 5.457 | 20 | 22 1 34.14 | 2.4577 | 17 28 48.7 | 12.891 |
| 21 | 20 2 47.88 | 2.5705 | 24 53 0.2 | 5.631 | 21 | 22 4 1.49 | 2.4540 | 17 15 51.5 | 13.015 |
| 22 | 20 5 22.10 | 2.5701 | 24 47 17.1 | 5.804 | 22 | 22 6 28.62 | 2.4503 | 17 2 46.9 | 13.137 |
| 23 | 20 7 56.29 | 2.5696 | S. 24 41 23.7 | 5.976 | 23 | 22 8 55.53 | 2.4467 | S. 16 49 35.0 | 13.259 |
| MONDAY 14. | | | | | WEDNESDAY 16. | | | | |
| 0 | 20 10 30.45 | 2.5690 | S. 24 35 20.0 | 6.149 | 0 | 22 11 22.23 | 2.4431 | S. 16 36 15.8 | 13.379 |
| 1 | 20 13 4.57 | 2.5682 | 24 29 5.9 | 6.321 | 1 | 22 13 48.71 | 2.4394 | 16 22 49.5 | 13.496 |
| 2 | 20 15 38.63 | 2.5673 | 24 22 41.5 | 6.492 | 2 | 22 16 14.96 | 2.4357 | 16 9 16.3 | 13.611 |
| 3 | 20 18 12.64 | 2.5663 | 24 16 6.9 | 6.662 | 3 | 22 18 40.99 | 2.4320 | 15 55 36.2 | 13.725 |
| 4 | 20 20 46.59 | 2.5652 | 24 9 22.0 | 6.833 | 4 | 22 21 6.80 | 2.4284 | 15 41 49.3 | 13.837 |
| 5 | 20 23 20.47 | 2.5641 | 24 2 26.9 | 7.003 | 5 | 22 23 32.40 | 2.4247 | 15 27 55.7 | 13.947 |
| 6 | 20 25 54.28 | 2.5628 | 23 55 21.6 | 7.173 | 6 | 22 25 57.77 | 2.4210 | 15 13 55.6 | 14.056 |
| 7 | 20 28 28.01 | 2.5614 | 23 48 6.1 | 7.342 | 7 | 22 28 22.92 | 2.4174 | 14 59 49.0 | 14.163 |
| 8 | 20 31 1.65 | 2.5598 | 23 40 40.5 | 7.510 | 8 | 22 30 47.86 | 2.4138 | 14 45 36.0 | 14.268 |
| 9 | 20 33 35.19 | 2.5582 | 23 33 4.9 | 7.677 | 9 | 22 33 12.58 | 2.4102 | 14 31 16.8 | 14.372 |
| 10 | 20 36 8.64 | 2.5566 | 23 25 19.3 | 7.844 | 10 | 22 35 37.09 | 2.4066 | 14 16 51.4 | 14.473 |
| 11 | 20 38 41.99 | 2.5548 | 23 17 23.6 | 8.011 | 11 | 22 38 1.38 | 2.4030 | 14 2 20.0 | 14.572 |
| 12 | 20 41 15.22 | 2.5529 | 23 9 18.0 | 8.176 | 12 | 22 40 25.45 | 2.3994 | 13 47 42.7 | 14.670 |
| 13 | 20 43 48.34 | 2.5510 | 23 1 2.5 | 8.341 | 13 | 22 42 49.31 | 2.3959 | 13 32 59.6 | 14.766 |
| 14 | 20 46 21.34 | 2.5489 | 22 52 37.1 | 8.504 | 14 | 22 45 12.96 | 2.3923 | 13 18 10.8 | 14.859 |
| 15 | 20 48 54.21 | 2.5467 | 22 44 2.0 | 8.667 | 15 | 22 47 36.39 | 2.3888 | 13 3 16.5 | 14.951 |
| 16 | 20 51 26.95 | 2.5445 | 22 35 17.1 | 8.829 | 16 | 22 49 59.61 | 2.3853 | 12 48 16.7 | 15.041 |
| 17 | 20 53 59.55 | 2.5422 | 22 26 22.5 | 8.990 | 17 | 22 52 22.63 | 2.3819 | 12 33 11.6 | 15.129 |
| 18 | 20 56 32.02 | 2.5399 | 22 17 18.3 | 9.150 | 18 | 22 54 45.44 | 2.3785 | 12 18 1.2 | 15.216 |
| 19 | 20 59 4.34 | 2.5374 | 22 8 4.5 | 9.310 | 19 | 22 57 8.05 | 2.3751 | 12 2 45.7 | 15.309 |
| 20 | 21 1 36.51 | 2.5348 | 21 58 41.1 | 9.468 | 20 | 22 59 30.45 | 2.3717 | 11 47 25.3 | 15.381 |
| 21 | 21 4 8.52 | 2.5322 | 21 49 8.3 | 9.625 | 21 | 23 1 52.65 | 2.3684 | 11 32 0.0 | 15.461 |
| 22 | 21 6 40.38 | 2.5296 | 21 39 26.1 | 9.781 | 22 | 23 4 14.65 | 2.3651 | 11 16 30.0 | 15.538 |
| 23 | 21 9 12.07 | 2.5269 | 21 29 34.6 | 9.936 | 23 | 23 6 36.46 | 2.3618 | 11 0 55.4 | 15.615 |
| 24 | 21 11 43.60 | 2.5241 | S. 21 19 33.8 | 10.090 | 24 | 23 8 58.07 | 2.3586 | S. 10 45 16.2 | 15.690 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|---|---------------------|------------------|---------------------|--------------|---|---------------------|-----------------|---------------------|
| THURSDAY 17. | | | | | SATURDAY 19. | | | | |
| 0 | ^h 23 ^m 8 ^s 58.07 | 2.3586 | S. 10° 45' 16.2" | 15.690 | 0 | ^h 0 ^m 59 ^s 27.27 | 2.9683 | N. 2° 34' 12.6" | 16.834 |
| 1 | 23 11 19.49 | 2.3554 | 10 29 32.6 | 15.762 | 1 | 1 1 43.35 | 2.9679 | 2 51 1.9 | 16.698 |
| 2 | 23 13 40.72 | 2.3522 | 10 13 44.8 | 15.831 | 2 | 1 3 59.42 | 2.9676 | 3 7 49.6 | 16.780 |
| 3 | 23 16 1.76 | 2.3492 | 9 57 52.9 | 15.899 | 3 | 1 6 15.47 | 2.9674 | 3 24 35.5 | 16.750 |
| 4 | 23 18 22.62 | 2.3462 | 9 41 56.9 | 15.968 | 4 | 1 8 31.51 | 2.9673 | 3 41 19.6 | 16.719 |
| 5 | 23 20 43.30 | 2.3432 | 9 25 57.0 | 16.030 | 5 | 1 10 47.55 | 2.9672 | 3 58 1.8 | 16.687 |
| 6 | 23 23 3.80 | 2.3402 | 9 9 53.3 | 16.092 | 6 | 1 13 3.58 | 2.9672 | 4 14 42.0 | 16.652 |
| 7 | 23 25 24.12 | 2.3373 | 8 53 46.0 | 16.152 | 7 | 1 15 19.61 | 2.9673 | 4 31 20.0 | 16.614 |
| 8 | 23 27 44.27 | 2.3344 | 8 37 35.1 | 16.210 | 8 | 1 17 35.65 | 2.9674 | 4 47 55.7 | 16.574 |
| 9 | 23 30 4.25 | 2.3316 | 8 21 20.8 | 16.265 | 9 | 1 19 51.70 | 2.9676 | 5 4 28.9 | 16.533 |
| 10 | 23 32 24.06 | 2.3288 | 8 5 3.3 | 16.318 | 10 | 1 22 7.76 | 2.9678 | 5 20 59.6 | 16.491 |
| 11 | 23 34 43.70 | 2.3260 | 7 48 42.6 | 16.371 | 11 | 1 24 23.84 | 2.9681 | 5 37 27.8 | 16.446 |
| 12 | 23 37 3.18 | 2.3233 | 7 32 18.8 | 16.421 | 12 | 1 26 39.94 | 2.9685 | 5 53 53.2 | 16.399 |
| 13 | 23 39 22.50 | 2.3207 | 7 15 52.1 | 16.468 | 13 | 1 28 56.06 | 2.9689 | 6 10 15.7 | 16.351 |
| 14 | 23 41 41.67 | 2.3182 | 6 59 22.7 | 16.513 | 14 | 1 31 12.21 | 2.9694 | 6 26 35.3 | 16.302 |
| 15 | 23 44 0.69 | 2.3157 | 6 42 50.6 | 16.556 | 15 | 1 33 28.39 | 2.9699 | 6 42 51.9 | 16.250 |
| 16 | 23 46 19.56 | 2.3133 | 6 26 16.0 | 16.597 | 16 | 1 35 44.60 | 2.9705 | 6 59 5.3 | 16.196 |
| 17 | 23 48 38.29 | 2.3110 | 6 9 38.9 | 16.637 | 17 | 1 38 0.85 | 2.9711 | 7 15 15.4 | 16.141 |
| 18 | 23 50 56.88 | 2.3087 | 5 52 59.5 | 16.674 | 18 | 1 40 17.14 | 2.9718 | 7 31 22.2 | 16.084 |
| 19 | 23 53 15.33 | 2.3064 | 5 36 18.0 | 16.708 | 19 | 1 42 33.47 | 2.9726 | 7 47 25.5 | 16.025 |
| 20 | 23 55 33.65 | 2.3042 | 5 19 34.5 | 16.742 | 20 | 1 44 49.85 | 2.9735 | 8 3 25.2 | 15.963 |
| 21 | 23 57 51.83 | 2.3020 | 5 2 49.0 | 16.773 | 21 | 1 47 6.29 | 2.9744 | 8 19 21.1 | 15.900 |
| 22 | 0 0 9.89 | 2.3000 | 4 46 1.7 | 16.802 | 22 | 1 49 22.78 | 2.9753 | 8 35 13.2 | 15.837 |
| 23 | 0 2 27.82 | 2.2978 | S. 4 29 12.8 | 16.828 | 23 | 1 51 39.33 | 2.9763 | N. 8 51 1.5 | 15.772 |
| FRIDAY 18. | | | | | SUNDAY 20. | | | | |
| 0 | 0 4 45.63 | 2.2958 | S. 4 12 22.3 | 16.853 | 0 | 1 53 55.94 | 2.9773 | N. 9 6 45.8 | 15.704 |
| 1 | 0 7 3.32 | 2.2940 | 3 55 30.4 | 16.876 | 1 | 1 56 12.61 | 2.9784 | 9 22 26.0 | 15.635 |
| 2 | 0 9 20.91 | 2.2923 | 3 38 37.2 | 16.897 | 2 | 1 58 29.35 | 2.9796 | 9 38 2.0 | 15.563 |
| 3 | 0 11 38.39 | 2.2904 | 3 21 42.8 | 16.915 | 3 | 2 0 46.16 | 2.9808 | 9 53 33.6 | 15.490 |
| 4 | 0 13 55.76 | 2.2887 | 3 4 47.4 | 16.931 | 4 | 2 3 3.04 | 2.9820 | 10 9 0.8 | 15.417 |
| 5 | 0 16 13.03 | 2.2871 | 2 47 51.1 | 16.946 | 5 | 2 5 20.00 | 2.9833 | 10 24 23.6 | 15.341 |
| 6 | 0 18 30.21 | 2.2855 | 2 30 53.9 | 16.958 | 6 | 2 7 37.03 | 2.9845 | 10 39 41.8 | 15.263 |
| 7 | 0 20 47.29 | 2.2839 | 2 13 56.1 | 16.968 | 7 | 2 9 54.14 | 2.9859 | 10 54 55.2 | 15.184 |
| 8 | 0 23 4.28 | 2.2825 | 1 56 57.7 | 16.977 | 8 | 2 12 11.34 | 2.9874 | 11 10 3.9 | 15.104 |
| 9 | 0 25 21.19 | 2.2811 | 1 39 58.9 | 16.983 | 9 | 2 14 28.63 | 2.9889 | 11 25 7.7 | 15.022 |
| 10 | 0 27 38.02 | 2.2798 | 1 22 59.7 | 16.987 | 10 | 2 16 46.01 | 2.9904 | 11 40 6.5 | 14.938 |
| 11 | 0 29 54.77 | 2.2785 | 1 6 0.4 | 16.989 | 11 | 2 19 3.48 | 2.9919 | 11 55 0.2 | 14.853 |
| 12 | 0 32 11.44 | 2.2773 | 0 49 1.0 | 16.989 | 12 | 2 21 21.04 | 2.9935 | 12 9 48.8 | 14.766 |
| 13 | 0 34 28.04 | 2.2762 | 0 32 1.7 | 16.987 | 13 | 2 23 38.70 | 2.9951 | 12 24 32.1 | 14.677 |
| 14 | 0 36 44.58 | 2.2752 | S. 0 15 2.6 | 16.983 | 14 | 2 25 56.46 | 2.9968 | 12 39 10.1 | 14.587 |
| 15 | 0 39 1.06 | 2.2744 | N. 0 1 56.3 | 16.977 | 15 | 2 28 14.31 | 2.9984 | 12 53 42.6 | 14.496 |
| 16 | 0 41 17.48 | 2.2733 | 0 18 54.7 | 16.969 | 16 | 2 30 32.27 | 2.3002 | 13 8 9.6 | 14.403 |
| 17 | 0 43 33.85 | 2.2724 | 0 35 52.6 | 16.959 | 17 | 2 32 50.34 | 2.3020 | 13 22 31.0 | 14.309 |
| 18 | 0 45 50.17 | 2.2716 | 0 52 49.8 | 16.947 | 18 | 2 35 8.51 | 2.3038 | 13 36 46.7 | 14.213 |
| 19 | 0 48 6.44 | 2.2708 | 1 9 46.3 | 16.933 | 19 | 2 37 26.79 | 2.3056 | 13 50 56.6 | 14.117 |
| 20 | 0 50 22.67 | 2.2702 | 1 26 41.8 | 16.917 | 20 | 2 39 45.18 | 2.3075 | 14 5 0.7 | 14.018 |
| 21 | 0 52 38.87 | 2.2696 | 1 43 36.3 | 16.899 | 21 | 2 42 3.69 | 2.3094 | 14 18 58.8 | 13.918 |
| 22 | 0 54 55.03 | 2.2691 | 2 0 29.7 | 16.879 | 22 | 2 44 22.31 | 2.3113 | 14 32 50.9 | 13.817 |
| 23 | 0 57 11.16 | 2.2687 | 2 17 21.8 | 16.857 | 23 | 2 46 41.04 | 2.3132 | 14 46 36.8 | 13.714 |
| 24 | 0 59 27.27 | 2.2683 | N. 2 34 12.6 | 16.834 | 24 | 2 48 59.89 | 2.3152 | N. 15 0 16.5 | 13.610 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|---------------------|----------------|---------------------|---------------|------------------|---------------------|-----------------|---------------------|
| MONDAY 21. | | | | | WEDNESDAY 23. | | | | |
| 0 | 2 48 59.89 | 2.3159 | N.15° 0' 16.5" | 13.610 | 0 | 4 42 26.46 | 2.4047 | N.23° 31' 58.6" | 7.357 |
| 1 | 2 51 18.86 | 2.3179 | 15 13 50.0 | 13.505 | 1 | 4 44 50.77 | 2.4058 | 23 39 15.5 | 7.307 |
| 2 | 2 53 37.95 | 2.3199 | 15 27 17.1 | 13.397 | 2 | 4 47 15.15 | 2.4068 | 23 46 23.5 | 7.058 |
| 3 | 2 55 57.16 | 2.3219 | 15 40 37.7 | 13.289 | 3 | 4 49 39.59 | 2.4077 | 23 53 22.5 | 6.908 |
| 4 | 2 58 16.49 | 2.3239 | 15 53 51.8 | 13.181 | 4 | 4 52 4.08 | 2.4086 | 24 0 12.5 | 6.758 |
| 5 | 3 0 35.94 | 2.3259 | 16 6 59.4 | 13.071 | 5 | 4 54 28.62 | 2.4094 | 24 6 53.5 | 6.607 |
| 6 | 3 2 55.52 | 2.3273 | 16 20 0.3 | 12.958 | 6 | 4 56 53.21 | 2.4102 | 24 13 25.4 | 6.456 |
| 7 | 3 5 15.22 | 2.3294 | 16 32 54.4 | 12.845 | 7 | 4 59 17.84 | 2.4109 | 24 19 48.2 | 6.305 |
| 8 | 3 7 35.05 | 2.3315 | 16 45 41.7 | 12.731 | 8 | 5 1 42.51 | 2.4115 | 24 26 2.0 | 6.154 |
| 9 | 3 9 55.00 | 2.3336 | 16 58 22.1 | 12.615 | 9 | 5 4 7.22 | 2.4121 | 24 32 6.7 | 6.002 |
| 10 | 3 12 15.08 | 2.3357 | 17 10 55.5 | 12.498 | 10 | 5 6 31.96 | 2.4126 | 24 38 2.2 | 5.849 |
| 11 | 3 14 35.28 | 2.3378 | 17 23 21.9 | 12.381 | 11 | 5 8 56.73 | 2.4130 | 24 43 48.6 | 5.697 |
| 12 | 3 16 55.61 | 2.3399 | 17 35 41.2 | 12.262 | 12 | 5 11 21.52 | 2.4133 | 24 49 25.9 | 5.545 |
| 13 | 3 19 16.07 | 2.3421 | 17 47 53.3 | 12.142 | 13 | 5 13 46.33 | 2.4136 | 24 54 54.0 | 5.392 |
| 14 | 3 21 36.66 | 2.3442 | 17 59 58.2 | 12.020 | 14 | 5 16 11.15 | 2.4138 | 25 0 12.9 | 5.239 |
| 15 | 3 23 57.37 | 2.3463 | 18 11 55.7 | 11.897 | 15 | 5 18 35.98 | 2.4139 | 25 5 22.7 | 5.086 |
| 16 | 3 26 18.21 | 2.3484 | 18 23 45.8 | 11.774 | 16 | 5 21 0.82 | 2.4139 | 25 10 23.3 | 4.932 |
| 17 | 3 28 39.18 | 2.3506 | 18 35 28.5 | 11.650 | 17 | 5 23 25.65 | 2.4138 | 25 15 14.6 | 4.778 |
| 18 | 3 31 0.28 | 2.3527 | 18 47 3.8 | 11.525 | 18 | 5 25 50.48 | 2.4137 | 25 19 56.7 | 4.625 |
| 19 | 3 33 21.50 | 2.3548 | 18 58 31.5 | 11.397 | 19 | 5 28 15.30 | 2.4136 | 25 24 20.6 | 4.472 |
| 20 | 3 35 42.85 | 2.3569 | 19 9 51.5 | 11.269 | 20 | 5 30 40.11 | 2.4133 | 25 28 53.3 | 4.318 |
| 21 | 3 38 4.33 | 2.3590 | 19 21 3.8 | 11.140 | 21 | 5 33 4.90 | 2.4130 | 25 33 7.8 | 4.164 |
| 22 | 3 40 25.93 | 2.3610 | 19 32 8.3 | 11.011 | 22 | 5 35 29.67 | 2.4126 | 25 37 13.0 | 4.010 |
| 23 | 3 42 47.65 | 2.3630 | N.19 43 5.1 | 10.881 | 23 | 5 37 54.40 | 2.4119 | N.25 41 9.0 | 3.857 |
| TUESDAY 22. | | | | | THURSDAY 24. | | | | |
| 0 | 3 45 9.49 | 2.3650 | N.19 53 54.0 | 10.749 | 0 | 5 40 19.10 | 2.4114 | N.25 44 55.8 | 3.703 |
| 1 | 3 47 31.45 | 2.3671 | 20 4 35.0 | 10.617 | 1 | 5 42 43.77 | 2.4107 | 25 48 33.4 | 3.550 |
| 2 | 3 49 53.54 | 2.3692 | 20 15 8.0 | 10.483 | 2 | 5 45 8.39 | 2.4099 | 25 52 1.8 | 3.396 |
| 3 | 3 52 15.75 | 2.3713 | 20 25 32.9 | 10.348 | 3 | 5 47 32.96 | 2.4090 | 25 55 20.9 | 3.242 |
| 4 | 3 54 38.08 | 2.3731 | 20 35 49.7 | 10.213 | 4 | 5 49 57.47 | 2.4081 | 25 58 30.8 | 3.089 |
| 5 | 3 57 0.52 | 2.3750 | 20 45 58.5 | 10.078 | 5 | 5 52 21.93 | 2.4072 | 26 1 31.6 | 2.936 |
| 6 | 3 59 23.08 | 2.3769 | 20 55 59.1 | 9.941 | 6 | 5 54 46.33 | 2.4061 | 26 4 23.1 | 2.782 |
| 7 | 4 1 45.75 | 2.3788 | 21 5 51.4 | 9.803 | 7 | 5 57 10.66 | 2.4049 | 26 7 5.4 | 2.629 |
| 8 | 4 4 8.53 | 2.3807 | 21 15 35.4 | 9.665 | 8 | 5 59 34.91 | 2.4036 | 26 9 38.6 | 2.477 |
| 9 | 4 6 31.43 | 2.3825 | 21 25 11.2 | 9.527 | 9 | 6 1 59.09 | 2.4023 | 26 12 2.6 | 2.324 |
| 10 | 4 8 54.43 | 2.3843 | 21 34 38.6 | 9.386 | 10 | 6 4 23.19 | 2.4008 | 26 14 17.5 | 2.172 |
| 11 | 4 11 17.54 | 2.3861 | 21 43 57.5 | 9.244 | 11 | 6 6 47.19 | 2.3993 | 26 16 23.2 | 2.019 |
| 12 | 4 13 40.76 | 2.3878 | 21 53 7.9 | 9.103 | 12 | 6 9 11.10 | 2.3977 | 26 18 19.8 | 1.867 |
| 13 | 4 16 4.08 | 2.3894 | 22 2 9.8 | 8.961 | 13 | 6 11 34.91 | 2.3960 | 26 20 7.3 | 1.716 |
| 14 | 4 18 27.49 | 2.3910 | 22 11 3.2 | 8.818 | 14 | 6 13 58.62 | 2.3942 | 26 21 45.7 | 1.565 |
| 15 | 4 20 51.00 | 2.3926 | 22 19 48.0 | 8.675 | 15 | 6 16 22.21 | 2.3923 | 26 23 15.1 | 1.414 |
| 16 | 4 23 14.60 | 2.3941 | 22 28 24.2 | 8.531 | 16 | 6 18 45.69 | 2.3904 | 26 24 35.4 | 1.263 |
| 17 | 4 25 38.29 | 2.3957 | 22 36 51.7 | 8.386 | 17 | 6 21 9.06 | 2.3884 | 26 25 46.7 | 1.112 |
| 18 | 4 28 2.08 | 2.3972 | 22 45 10.5 | 8.240 | 18 | 6 23 32.30 | 2.3863 | 26 26 48.9 | 0.960 |
| 19 | 4 30 25.95 | 2.3985 | 22 53 20.5 | 8.094 | 19 | 6 25 55.41 | 2.3841 | 26 27 42.2 | 0.813 |
| 20 | 4 32 49.90 | 2.3998 | 23 1 21.8 | 7.948 | 20 | 6 28 18.39 | 2.3818 | 26 28 26.5 | 0.663 |
| 21 | 4 35 13.93 | 2.4011 | 23 9 14.3 | 7.801 | 21 | 6 30 41.23 | 2.3795 | 26 29 1.8 | 0.514 |
| 22 | 4 37 38.03 | 2.4024 | 23 16 57.9 | 7.654 | 22 | 6 33 3.93 | 2.3770 | 26 29 28.2 | 0.366 |
| 23 | 4 40 2.21 | 2.4036 | 23 24 32.7 | 7.506 | 23 | 6 35 26.47 | 2.3744 | 26 29 45.8 | 0.219 |
| 24 | 4 42 26.46 | 2.4047 | N.23 31 58.6 | 7.357 | 24 | 6 37 48.86 | 2.3718 | N.26 29 54.5 | + 0.072 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|------------------|---------------------|------------|------------------|---------------------|------------------|---------------------|
| FRIDAY 25. | | | | | SUNDAY 27. | | | | |
| 0 | h m s | a | N. 26° 29' 54.5" | + 0.073 | 0 | h m s | a | N. 23° 55' 43.2" | 6.900 |
| 1 | 6 37 48.86 | 2.3718 | 26 29 54.4 | - 0.075 | 1 | 8 27 24.75 | 2.1755 | 23 49 27.9 | 6.310 |
| 2 | 6 40 11.09 | 2.3692 | 26 29 45.5 | 0.222 | 2 | 8 31 45.21 | 2.1655 | 23 43 6.0 | 6.430 |
| 3 | 6 44 55.06 | 2.3636 | 26 29 27.8 | 0.368 | 3 | 8 33 54.99 | 2.1604 | 23 36 37.5 | 6.528 |
| 4 | 6 47 16.79 | 2.3607 | 26 29 1.3 | 0.513 | 4 | 8 36 4.46 | 2.1553 | 23 30 2.6 | 6.635 |
| 5 | 6 49 38.34 | 2.3577 | 26 28 26.2 | 0.657 | 5 | 8 38 13.63 | 2.1503 | 23 23 21.3 | 6.742 |
| 6 | 6 51 59.72 | 2.3547 | 26 27 42.4 | 0.802 | 6 | 8 40 22.50 | 2.1452 | 23 16 33.6 | 6.847 |
| 7 | 6 54 20.91 | 2.3516 | 26 26 49.9 | 0.946 | 7 | 8 42 31.06 | 2.1402 | 23 9 39.6 | 6.952 |
| 8 | 6 56 41.91 | 2.3483 | 26 25 48.9 | 1.089 | 8 | 8 44 39.32 | 2.1352 | 23 2 39.3 | 7.056 |
| 9 | 6 59 2.71 | 2.3450 | 26 24 39.3 | 1.232 | 9 | 8 46 47.28 | 2.1301 | 22 55 32.9 | 7.158 |
| 10 | 7 1 23.31 | 2.3417 | 26 23 21.1 | 1.373 | 10 | 8 48 54.93 | 2.1250 | 22 48 20.4 | 7.260 |
| 11 | 7 3 43.71 | 2.3383 | 26 21 54.5 | 1.514 | 11 | 8 51 2.28 | 2.1199 | 22 41 1.7 | 7.362 |
| 12 | 7 6 3.91 | 2.3348 | 26 20 19.4 | 1.655 | 12 | 8 53 9.32 | 2.1148 | 22 33 37.0 | 7.462 |
| 13 | 7 8 23.89 | 2.3313 | 26 18 35.9 | 1.795 | 13 | 8 55 16.06 | 2.1097 | 22 26 6.3 | 7.561 |
| 14 | 7 10 43.66 | 2.3277 | 26 16 44.0 | 1.934 | 14 | 8 57 22.49 | 2.1047 | 22 18 29.7 | 7.658 |
| 15 | 7 13 3.21 | 2.3240 | 26 14 43.8 | 2.072 | 15 | 8 59 28.62 | 2.0997 | 22 10 47.3 | 7.755 |
| 16 | 7 15 22.54 | 2.3202 | 26 12 35.3 | 2.210 | 16 | 9 1 34.45 | 2.0946 | 22 2 59.1 | 7.852 |
| 17 | 7 17 41.64 | 2.3164 | 26 10 18.6 | 2.348 | 17 | 9 3 39.97 | 2.0896 | 21 55 5.1 | 7.947 |
| 18 | 7 20 0.51 | 2.3125 | 26 7 53.6 | 2.485 | 18 | 9 5 45.20 | 2.0846 | 21 47 5.4 | 8.042 |
| 19 | 7 22 19.14 | 2.3086 | 26 5 20.4 | 2.620 | 19 | 9 7 50.13 | 2.0796 | 21 39 0.1 | 8.135 |
| 20 | 7 24 37.54 | 2.3047 | 26 2 39.2 | 2.754 | 20 | 9 9 54.75 | 2.0745 | 21 30 49.2 | 8.227 |
| 21 | 7 26 55.70 | 2.3006 | 25 59 49.9 | 2.888 | 21 | 9 11 59.07 | 2.0695 | 21 22 32.8 | 8.319 |
| 22 | 7 29 13.61 | 2.2964 | 25 56 52.6 | 3.022 | 22 | 9 14 3.09 | 2.0645 | 21 14 10.9 | 8.410 |
| 23 | 7 31 31.27 | 2.2923 | N. 25° 53' 47.3" | 3.155 | 23 | 9 16 6.81 | 2.0596 | N. 21° 5' 43.6" | 8.499 |
| SATURDAY 26. | | | | | MONDAY 28. | | | | |
| 0 | 7 33 48.69 | 2.2882 | N. 25° 50' 34.0" | 3.287 | 0 | 9 18 10.24 | 2.0547 | N. 20° 57' 11.0" | 8.588 |
| 1 | 7 36 5.85 | 2.2839 | 25 47 12.8 | 3.418 | 1 | 9 20 13.37 | 2.0497 | 20 48 31.1 | 8.676 |
| 2 | 7 38 22.75 | 2.2796 | 25 43 43.8 | 3.548 | 2 | 9 22 16.20 | 2.0448 | 20 39 49.9 | 8.763 |
| 3 | 7 40 39.40 | 2.2752 | 25 40 7.0 | 3.678 | 3 | 9 24 18.74 | 2.0399 | 20 31 1.5 | 8.849 |
| 4 | 7 42 55.78 | 2.2707 | 25 36 22.5 | 3.807 | 4 | 9 26 20.99 | 2.0351 | 20 22 8.0 | 8.934 |
| 5 | 7 45 11.89 | 2.2663 | 25 32 30.2 | 3.935 | 5 | 9 28 22.95 | 2.0302 | 20 13 9.4 | 9.017 |
| 6 | 7 47 27.74 | 2.2619 | 25 28 30.3 | 4.063 | 6 | 9 30 24.61 | 2.0253 | 20 4 5.9 | 9.100 |
| 7 | 7 49 43.32 | 2.2573 | 25 24 22.8 | 4.188 | 7 | 9 32 25.98 | 2.0205 | 19 54 57.4 | 9.183 |
| 8 | 7 51 58.62 | 2.2527 | 25 20 7.8 | 4.313 | 8 | 9 34 27.07 | 2.0158 | 19 45 43.9 | 9.265 |
| 9 | 7 54 13.65 | 2.2482 | 25 15 45.3 | 4.438 | 9 | 9 36 27.88 | 2.0111 | 19 36 25.6 | 9.345 |
| 10 | 7 56 28.41 | 2.2436 | 25 11 15.3 | 4.562 | 10 | 9 38 28.40 | 2.0064 | 19 27 2.5 | 9.425 |
| 11 | 7 58 42.88 | 2.2389 | 25 6 37.9 | 4.684 | 11 | 9 40 28.64 | 2.0017 | 19 17 34.6 | 9.504 |
| 12 | 8 0 57.07 | 2.2341 | 25 1 53.2 | 4.806 | 12 | 9 42 28.60 | 1.9970 | 19 8 2.0 | 9.582 |
| 13 | 8 3 10.97 | 2.2294 | 24 57 1.2 | 4.927 | 13 | 9 44 28.28 | 1.9923 | 18 58 24.7 | 9.659 |
| 14 | 8 5 24.59 | 2.2247 | 24 52 1.9 | 5.047 | 14 | 9 46 27.68 | 1.9877 | 18 48 42.9 | 9.734 |
| 15 | 8 7 37.93 | 2.2199 | 24 46 55.5 | 5.166 | 15 | 9 48 26.81 | 1.9830 | 18 38 56.6 | 9.809 |
| 16 | 8 9 50.98 | 2.2150 | 24 41 42.0 | 5.284 | 16 | 9 50 25.67 | 1.9787 | 18 29 5.8 | 9.884 |
| 17 | 8 12 3.73 | 2.2101 | 24 36 21.4 | 5.402 | 17 | 9 52 24.25 | 1.9741 | 18 19 10.5 | 9.957 |
| 18 | 8 14 16.19 | 2.2052 | 24 30 53.7 | 5.520 | 18 | 9 54 22.56 | 1.9696 | 18 9 10.9 | 10.029 |
| 19 | 8 16 28.36 | 2.2003 | 24 25 19.0 | 5.635 | 19 | 9 56 20.60 | 1.9652 | 17 59 7.0 | 10.101 |
| 20 | 8 18 40.23 | 2.1954 | 24 19 37.5 | 5.749 | 20 | 9 58 18.38 | 1.9608 | 17 48 58.8 | 10.173 |
| 21 | 8 20 51.81 | 2.1905 | 24 13 49.1 | 5.863 | 21 | 10 0 15.90 | 1.9565 | 17 38 46.3 | 10.242 |
| 22 | 8 23 3.09 | 2.1855 | 24 7 53.9 | 5.977 | 22 | 10 2 13.16 | 1.9522 | 17 28 29.7 | 10.311 |
| 23 | 8 25 14.07 | 2.1805 | 24 1 51.9 | 6.089 | 23 | 10 4 10.16 | 1.9479 | 17 18 9.0 | 10.379 |
| 24 | 8 27 24.75 | 2.1755 | N. 23° 55' 43.2" | 6.200 | 24 | 10 6 6.90 | 1.9436 | N. 17° 7' 44.3" | 10.446 |

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|--|---------------------|------------------|---------------------|------------------------|--|---------------------|-----------------|---------------------|
| TUESDAY 29. | | | | | THURSDAY, OCTOBER 1. | | | | |
| 0 | ^h 10 ^m 6 ^s 6.90 | 1.9436 | N. 17° 7' 44.3" | 10.446 | 0 | ^h 11 ^m 35 ^s 22.53 | 1.7949 | N. 7° 44' 46.9" | 12.704 |
| 1 | 10 8 3.39 | 1.9394 | 16 57 15.5 | 10.512 | | | | | |
| 2 | 10 9 59.63 | 1.9352 | 16 46 42.8 | 10.577 | | | | | |
| 3 | 10 11 55.61 | 1.9310 | 16 36 6.2 | 10.642 | | | | | |
| 4 | 10 13 51.35 | 1.9270 | 16 25 25.8 | 10.706 | | | | | |
| 5 | 10 15 46.85 | 1.9230 | 16 14 41.5 | 10.769 | | | | | |
| 6 | 10 17 42.11 | 1.9190 | 16 3 53.5 | 10.831 | | | | | |
| 7 | 10 19 37.13 | 1.9150 | 15 53 1.8 | 10.892 | | | | | |
| 8 | 10 21 31.91 | 1.9111 | 15 42 6.5 | 10.952 | | | | | |
| 9 | 10 23 26.46 | 1.9072 | 15 31 7.6 | 11.012 | | | | | |
| 10 | 10 25 20.78 | 1.9034 | 15 20 5.1 | 11.070 | | | | | |
| 11 | 10 27 14.87 | 1.8996 | 15 8 59.2 | 11.128 | | | | | |
| 12 | 10 29 8.73 | 1.8958 | 14 57 49.8 | 11.185 | | | | | |
| 13 | 10 31 2.37 | 1.8921 | 14 46 37.0 | 11.241 | | | | | |
| 14 | 10 32 55.79 | 1.8885 | 14 35 20.9 | 11.296 | | | | | |
| 15 | 10 34 48.99 | 1.8849 | 14 24 1.5 | 11.351 | | | | | |
| 16 | 10 36 41.98 | 1.8814 | 14 12 38.8 | 11.404 | | | | | |
| 17 | 10 38 34.76 | 1.8779 | 14 1 13.0 | 11.457 | | | | | |
| 18 | 10 40 27.33 | 1.8745 | 13 49 44.0 | 11.509 | | | | | |
| 19 | 10 42 19.70 | 1.8711 | 13 38 11.9 | 11.560 | | | | | |
| 20 | 10 44 11.86 | 1.8677 | 13 26 36.8 | 11.611 | | | | | |
| 21 | 10 46 3.82 | 1.8643 | 13 14 58.6 | 11.661 | | | | | |
| 22 | 10 47 55.58 | 1.8611 | 13 3 17.5 | 11.709 | | | | | |
| 23 | 10 49 47.15 | 1.8579 | N. 12° 51' 33.5" | 11.757 | | | | | |
| WEDNESDAY 30. | | | | | PHASES OF THE MOON. | | | | |
| 0 | 10 51 38.53 | 1.8548 | N. 12° 39' 46.6" | 11.805 | ● New Moon . . . Sept. | ^d 2 ^h 20 ^m 16.0 | | | |
| 1 | 10 53 29.72 | 1.8517 | 12 27 56.9 | 11.851 | ☾ First Quarter . . . | 10 23 7.5 | | | |
| 2 | 10 55 20.73 | 1.8486 | 12 16 4.5 | 11.896 | ○ Full Moon | 17 17 3.8 | | | |
| 3 | 10 57 11.55 | 1.8455 | 12 4 9.4 | 11.941 | ☾ Last Quarter . . . | 24 11 7.2 | | | |
| 4 | 10 59 2.19 | 1.8426 | 11 52 11.6 | 11.986 | | | | | |
| 5 | 11 0 52.66 | 1.8397 | 11 40 11.1 | 12.029 | | | | | |
| 6 | 11 2 42.96 | 1.8369 | 11 28 8.1 | 12.071 | | | | | |
| 7 | 11 4 33.09 | 1.8341 | 11 16 2.6 | 12.113 | | | | | |
| 8 | 11 6 23.05 | 1.8313 | 11 3 54.6 | 12.154 | ☾ Apogee Sept. | ^d 4 ^h 8.2 | | | |
| 9 | 11 8 12.85 | 1.8286 | 10 51 44.1 | 12.195 | ☾ Perigee | 17 18.4 | | | |
| 10 | 11 10 2.49 | 1.8260 | 10 39 31.2 | 12.234 | | | | | |
| 11 | 11 11 51.97 | 1.8234 | 10 27 16.0 | 12.273 | | | | | |
| 12 | 11 13 41.30 | 1.8209 | 10 14 58.6 | 12.309 | | | | | |
| 13 | 11 15 30.48 | 1.8184 | 10 2 38.9 | 12.346 | | | | | |
| 14 | 11 17 19.51 | 1.8160 | 9 50 17.0 | 12.383 | | | | | |
| 15 | 11 19 8.40 | 1.8137 | 9 37 52.9 | 12.419 | | | | | |
| 16 | 11 20 57.15 | 1.8114 | 9 25 26.7 | 12.453 | | | | | |
| 17 | 11 22 45.77 | 1.8092 | 9 12 58.5 | 12.487 | | | | | |
| 18 | 11 24 34.25 | 1.8069 | 9 0 28.2 | 12.521 | | | | | |
| 19 | 11 26 22.60 | 1.8048 | 8 47 56.0 | 12.553 | | | | | |
| 20 | 11 28 10.83 | 1.8027 | 8 35 21.9 | 12.585 | | | | | |
| 21 | 11 29 58.93 | 1.8007 | 8 22 45.8 | 12.617 | | | | | |
| 22 | 11 31 46.91 | 1.7987 | 8 10 7.9 | 12.646 | | | | | |
| 23 | 11 33 34.78 | 1.7968 | 7 57 28.3 | 12.675 | | | | | |
| 24 | 11 35 22.53 | 1.7949 | N. 7° 44' 46.9" | 12.704 | | | | | |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIb. | P. L. of Diff. | VIh. | P. L. of Diff. | IXb. | P. L. of Diff. |
|-------------------|-------------------------------|--------------|----------------|--------------|----------------|-------------|----------------|-------------|----------------|
| 1 | α Arietis W. | 101° 10' 14" | 3103 | 102° 38' 20" | 3110 | 104° 6' 18" | 3115 | 105° 34' 9" | 3122 |
| | Aldebaran W. | 70 48 20 | 3031 | 72 17 54 | 3036 | 73 47 22 | 3040 | 75 16 45 | 3045 |
| | Pollux W. | 26 37 12 | 3027 | 28 6 51 | 3030 | 29 36 27 | 3033 | 31 5 59 | 3036 |
| | Sun E. | 20 52 21 | 3509 | 19 32 7 | 3534 | 18 12 20 | 3544 | 16 53 6 | 3599 |
| 4 | Sun W. | 13 23 16 | 3745 | 14 39 16 | 3693 | 15 56 11 | 3654 | 17 13 47 | 3625 |
| | Spica E. | 28 49 16 | 3153 | 27 22 11 | 3163 | 25 55 17 | 3173 | 24 28 35 | 3185 |
| | Antares E. | 74 28 54 | 3086 | 73 0 27 | 3087 | 71 32 2 | 3088 | 70 3 38 | 3088 |
| 5 | Sun W. | 23 47 40 | 3546 | 25 7 13 | 3536 | 26 26 57 | 3527 | 27 46 51 | 3519 |
| | Antares E. | 62 41 44 | 3089 | 61 13 21 | 3089 | 59 44 58 | 3088 | 58 16 34 | 3087 |
| | α Aquilæ E. | 108 46 26 | 3961 | 107 34 28 | 3965 | 106 22 14 | 3951 | 105 9 46 | 3937 |
| 6 | Sun W. | 34 28 23 | 3485 | 35 49 4 | 3480 | 37 9 51 | 3473 | 38 30 45 | 3468 |
| | Antares E. | 50 54 14 | 3080 | 49 25 40 | 3078 | 47 57 4 | 3076 | 46 28 25 | 3073 |
| | α Aquilæ E. | 99 4 20 | 3884 | 97 50 44 | 3875 | 96 36 59 | 3867 | 95 23 6 | 3860 |
| 7 | Sun W. | 45 16 58 | 3435 | 46 38 35 | 3428 | 48 0 20 | 3421 | 49 22 13 | 3413 |
| | Antares E. | 39 4 17 | 3058 | 37 35 16 | 3054 | 36 6 10 | 3051 | 34 37 0 | 3047 |
| | α Aquilæ E. | 89 12 4 | 3833 | 87 57 36 | 3830 | 86 43 5 | 3826 | 85 28 30 | 3824 |
| 8 | Sun W. | 56 13 53 | 3371 | 57 36 43 | 3362 | 58 59 43 | 3353 | 60 22 54 | 3343 |
| | Spica W. | 19 44 9 | 3124 | 21 11 50 | 3100 | 22 40 0 | 3077 | 24 8 38 | 3056 |
| | α Aquilæ E. | 79 15 12 | 3821 | 78 0 82 | 3823 | 76 45 54 | 3826 | 75 31 19 | 3829 |
| | Fomalhaut E. | 109 43 23 | 3178 | 108 16 47 | 3167 | 106 49 58 | 3155 | 105 22 55 | 3143 |
| 9 | Sun W. | 67 21 50 | 3287 | 68 46 17 | 3275 | 70 10 58 | 3262 | 71 35 54 | 3249 |
| | Spica W. | 31 37 41 | 2969 | 33 8 33 | 2954 | 34 39 44 | 2938 | 36 11 15 | 2923 |
| | α Aquilæ E. | 69 19 34 | 3861 | 68 5 35 | 3871 | 66 51 46 | 3863 | 65 38 9 | 3866 |
| | Fomalhaut E. | 98 4 11 | 3085 | 96 35 43 | 3073 | 95 7 1 | 3061 | 93 38 4 | 3049 |
| | α Pegasi E. | 116 13 41 | 3405 | 114 51 30 | 3382 | 113 28 53 | 3359 | 112 5 50 | 3338 |
| 10 | Sun W. | 78 44 30 | 3179 | 80 11 4 | 3163 | 81 37 57 | 3148 | 83 5 8 | 3133 |
| | Spica W. | 43 53 39 | 2846 | 45 27 7 | 2831 | 47 0 55 | 2815 | 48 35 3 | 2799 |
| | α Aquilæ E. | 59 34 4 | 3993 | 58 22 18 | 4022 | 57 11 0 | 4052 | 56 0 12 | 4087 |
| | Fomalhaut E. | 86 9 29 | 2986 | 84 38 59 | 2973 | 83 8 13 | 2960 | 81 37 10 | 2947 |
| | JUPITER E. | 96 11 56 | 2774 | 94 36 54 | 2761 | 93 1 35 | 2747 | 91 25 57 | 2733 |
| | α Pegasi E. | 105 4 28 | 3235 | 103 39 0 | 3216 | 102 13 10 | 3197 | 100 46 57 | 3178 |
| 11 | Sun W. | 90 25 56 | 3049 | 91 55 8 | 3031 | 93 24 42 | 3014 | 94 54 38 | 2995 |
| | Spica W. | 56 31 3 | 2716 | 58 7 21 | 2699 | 59 44 2 | 2682 | 61 21 6 | 2664 |
| | α Aquilæ E. | 50 15 54 | 4331 | 49 9 30 | 4398 | 48 4 7 | 4475 | 46 59 53 | 4559 |
| | Fomalhaut E. | 73 57 49 | 2882 | 72 25 7 | 2869 | 70 52 8 | 2856 | 69 18 53 | 2844 |
| | JUPITER E. | 83 22 56 | 2657 | 81 45 18 | 2640 | 80 7 18 | 2624 | 78 28 56 | 2607 |
| | α Pegasi E. | 93 30 19 | 3088 | 92 1 55 | 3071 | 90 33 10 | 3055 | 89 4 5 | 3038 |
| 12 | Sun W. | 102 30 6 | 2901 | 104 2 24 | 2882 | 105 35 6 | 2862 | 107 8 13 | 2843 |
| | Spica W. | 69 32 27 | 2574 | 71 11 57 | 2556 | 72 51 53 | 2537 | 74 32 15 | 2519 |
| | Antares W. | 23 42 7 | 2609 | 25 20 50 | 2585 | 27 0 6 | 2561 | 28 39 54 | 2538 |
| | Fomalhaut E. | 61 28 41 | 2786 | 59 53 55 | 2775 | 58 18 55 | 2766 | 56 43 43 | 2757 |
| | JUPITER E. | 70 11 20 | 2523 | 68 30 37 | 2504 | 66 49 30 | 2487 | 65 7 58 | 2468 |
| | α Pegasi E. | 81 33 39 | 2962 | 80 2 38 | 2947 | 78 31 19 | 2934 | 76 59 43 | 2921 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIb. | P. L. of Diff. | XXIb. | P. L. of Diff. |
|-------------------|-------------------------------|----|-------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|
| 1 | α Arietis | W. | 107° 1' 52" | 3187 | 108° 29' 29" | 3133 | 109° 56' 58" | 3139 | 111° 24' 20" | 3146 |
| | Aldebaran | W. | 76 46 2 | 3048 | 78 15 15 | 3052 | 79 44 23 | 3056 | 81 13 26 | 3060 |
| | Pollux | W. | 32 35 27 | 3039 | 34 4 52 | 3049 | 35 34 13 | 3045 | 37 3 30 | 3047 |
| | Sun | E. | 15 34 31 | 3044 | 14 16 44 | 3702 | 12 59 59 | 3779 | 11 44 35 | 3884 |
| 4 | Sun | W. | 18 31 54 | 3004 | 19 50 24 | 3086 | 21 9 14 | 3571 | 22 28 20 | 3558 |
| | Spica | E. | 23 2 8 | 3198 | 21 35 57 | 3216 | 20 10 7 | 3236 | 18 44 41 | 3260 |
| | Antares | E. | 68 35 14 | 3089 | 67 6 51 | 3090 | 65 38 29 | 3090 | 64 10 7 | 3089 |
| 5 | Sun | W. | 29 6 54 | 3512 | 30 27 5 | 3505 | 31 47 24 | 3498 | 33 7 50 | 3492 |
| | Antares | E. | 56 48 9 | 3087 | 55 19 43 | 3085 | 53 51 15 | 3084 | 52 22 46 | 3082 |
| | α Aquilæ | E. | 103 57 4 | 3925 | 102 44 10 | 3914 | 101 31 4 | 3903 | 100 17 47 | 3893 |
| 6 | Sun | W. | 39 51 45 | 3482 | 41 12 52 | 3454 | 42 34 7 | 3448 | 43 55 29 | 3442 |
| | Antares | E. | 44 59 42 | 3070 | 43 30 56 | 3068 | 42 2 7 | 3065 | 40 33 14 | 3061 |
| | α Aquilæ | E. | 94 9 6 | 3854 | 92 54 59 | 3848 | 91 40 46 | 3842 | 90 26 27 | 3838 |
| 7 | Sun | W. | 50 44 15 | 3406 | 52 6 25 | 3397 | 53 28 45 | 3389 | 54 51 14 | 3380 |
| | Antares | E. | 33 7 45 | 3043 | 31 38 26 | 3039 | 30 9 2 | 3036 | 28 39 34 | 3033 |
| | α Aquilæ | E. | 84 13 53 | 3822 | 82 59 14 | 3821 | 81 44 34 | 3820 | 80 29 53 | 3820 |
| 8 | Sun | W. | 61 46 16 | 3332 | 63 9 51 | 3321 | 64 33 38 | 3311 | 65 57 37 | 3299 |
| | Spica | W. | 25 37 41 | 3037 | 27 7 8 | 3018 | 28 36 58 | 3001 | 30 7 9 | 2985 |
| | α Aquilæ | E. | 74 16 47 | 3834 | 73 2 20 | 3839 | 71 47 58 | 3845 | 70 33 42 | 3853 |
| | Fomalhaut | E. | 103 55 38 | 3133 | 102 28 8 | 3190 | 101 0 23 | 3109 | 99 32 24 | 3097 |
| 9 | Sun | W. | 73 1 5 | 3226 | 74 26 31 | 3222 | 75 52 14 | 3209 | 77 18 13 | 3193 |
| | Spica | W. | 37 43 5 | 2908 | 39 15 14 | 2892 | 40 47 43 | 2877 | 42 20 31 | 2862 |
| | α Aquilæ | E. | 64 24 45 | 3913 | 63 11 37 | 3928 | 61 58 46 | 3947 | 60 46 14 | 3969 |
| | Fomalhaut | E. | 92 8 52 | 3037 | 90 39 25 | 3094 | 89 9 42 | 3011 | 87 39 43 | 2999 |
| | α Pegasi | E. | 110 42 22 | 3317 | 107 18 30 | 3295 | 107 54 13 | 3275 | 106 29 32 | 3255 |
| 10 | Sun | W. | 84 32 37 | 3117 | 86 0 26 | 3100 | 87 28 36 | 3083 | 88 57 6 | 3067 |
| | Spica | W. | 50 9 32 | 2783 | 51 44 22 | 2766 | 53 19 34 | 2750 | 54 55 7 | 2733 |
| | α Aquilæ | E. | 54 49 58 | 4196 | 53 40 21 | 4168 | 52 31 25 | 4216 | 51 23 14 | 4270 |
| | Fomalhaut | E. | 80 5 51 | 2934 | 78 34 15 | 2921 | 77 2 23 | 2908 | 75 30 14 | 2895 |
| | Jupiter | E. | 89 50 1 | 2718 | 88 13 45 | 2703 | 86 37 9 | 2698 | 85 0 13 | 2672 |
| | α Pegasi | E. | 99 20 21 | 3159 | 97 53 23 | 3141 | 96 26 3 | 3124 | 94 58 22 | 3105 |
| 11 | Sun | W. | 96 24 57 | 2977 | 97 55 39 | 2958 | 99 26 44 | 2939 | 100 58 13 | 2920 |
| | Spica | W. | 62 58 34 | 2647 | 64 36 25 | 2629 | 66 14 41 | 2610 | 67 53 22 | 2593 |
| | α Aquilæ | E. | 45 56 53 | 4656 | 44 55 16 | 4763 | 43 55 9 | 4885 | 42 56 42 | 5092 |
| | Fomalhaut | E. | 67 45 22 | 2831 | 66 11 35 | 2819 | 64 37 32 | 2808 | 63 3 14 | 2796 |
| | Jupiter | E. | 76 50 11 | 2591 | 75 11 4 | 2574 | 73 31 33 | 2557 | 71 51 39 | 2539 |
| | α Pegasi | E. | 87 34 39 | 3022 | 86 4 53 | 3005 | 84 34 47 | 2990 | 83 4 22 | 2976 |
| 12 | Sun | W. | 108 41 45 | 2823 | 110 15 43 | 2804 | 111 50 6 | 2784 | 113 24 55 | 2764 |
| | Spica | W. | 76 13 2 | 2500 | 77 54 15 | 2481 | 79 35 55 | 2462 | 81 18 1 | 2443 |
| | Antares | W. | 30 20 14 | 2517 | 32 1 4 | 2494 | 33 42 25 | 2474 | 35 24 15 | 2453 |
| | Fomalhaut | E. | 55 8 19 | 2750 | 53 32 45 | 2744 | 51 57 3 | 2738 | 50 21 14 | 2735 |
| | Jupiter | E. | 63 26 0 | 2450 | 61 43 37 | 2433 | 60 0 49 | 2415 | 58 17 35 | 2396 |
| | α Pegasi | E. | 75 27 51 | 2909 | 73 55 44 | 2898 | 72 23 23 | 2887 | 70 50 48 | 2879 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|
| 13 | SUN W. | 115° 0' 10" | 9744 | 116° 35' 51" | 9785 | 118° 11' 57" | 9765 | 119° 48' 30" | 9687 |
| | Spica W. | 83 0 34 | 9494 | 84 43 34 | 9408 | 86 27 0 | 9387 | 88 10 53 | 9369 |
| | Antares W. | 37 6 35 | 9439 | 38 49 24 | 9419 | 40 32 42 | 9391 | 42 16 29 | 9371 |
| | Fomalhaut E. | 48 45 20 | 9732 | 47 9 23 | 9733 | 45 33 27 | 9735 | 43 57 34 | 9740 |
| | JUPITER E. | 56 33 55 | 9378 | 54 49 49 | 9361 | 53 5 18 | 9343 | 51 20 21 | 9325 |
| | α Pegasi E. | 69 18 2 | 9870 | 67 45 5 | 9853 | 66 11 59 | 9857 | 64 38 45 | 9853 |
| 14 | α Arietis E. | 111 0 49 | 9515 | 109 19 56 | 9494 | 107 38 34 | 9473 | 105 56 43 | 9453 |
| | SUN W. | 127 57 37 | 9593 | 129 36 42 | 9574 | 131 16 12 | 9558 | 132 56 5 | 9540 |
| | Spica W. | 96 56 55 | 9279 | 98 43 26 | 9261 | 100 30 23 | 9244 | 102 17 45 | 9227 |
| | Antares W. | 51 2 29 | 9276 | 52 49 4 | 9258 | 54 36 6 | 9240 | 56 23 34 | 9222 |
| | JUPITER E. | 42 29 14 | 9240 | 40 41 47 | 9225 | 38 53 55 | 9208 | 37 5 40 | 9193 |
| | α Pegasi E. | 56 52 0 | 9860 | 55 18 50 | 9849 | 53 45 51 | 9831 | 52 13 8 | 9817 |
| 15 | α Arietis E. | 97 20 27 | 9357 | 95 35 50 | 9338 | 93 50 46 | 9320 | 92 5 16 | 9303 |
| | Antares W. | 65 27 19 | 9140 | 67 17 17 | 9125 | 69 7 38 | 9111 | 70 58 21 | 9097 |
| | α Arietis E. | 83 11 43 | 9225 | 81 23 53 | 9211 | 79 35 42 | 9198 | 77 47 11 | 9186 |
| | Aldebaran E. | 113 36 5 | 9161 | 111 46 39 | 9145 | 109 56 48 | 9130 | 108 6 34 | 9115 |
| | Antares W. | 80 17 0 | 9036 | 82 9 38 | 9026 | 84 2 32 | 9016 | 85 55 41 | 9007 |
| | α Aquilæ W. | 43 59 51 | 4163 | 45 8 52 | 4013 | 46 20 19 | 3877 | 47 34 2 | 3757 |
| 16 | α Arietis E. | 68 40 23 | 9136 | 66 50 19 | 9130 | 65 0 5 | 9123 | 63 9 41 | 9118 |
| | Aldebaran E. | 98 50 15 | 9054 | 96 58 5 | 9043 | 95 5 38 | 9033 | 93 12 56 | 9025 |
| | Antares W. | 95 24 29 | 1975 | 97 18 43 | 1971 | 99 13 3 | 1967 | 101 7 29 | 1965 |
| | α Aquilæ W. | 54 10 50 | 3308 | 55 34 52 | 3244 | 57 0 9 | 3185 | 58 26 36 | 3133 |
| | α Arietis E. | 53 56 32 | 9115 | 52 5 55 | 9118 | 50 15 23 | 9123 | 48 24 59 | 9131 |
| | Aldebaran E. | 83 46 27 | 1993 | 81 52 42 | 1989 | 79 58 50 | 1986 | 78 4 54 | 1984 |
| 17 | Antares W. | 95 24 29 | 1975 | 97 18 43 | 1971 | 99 13 3 | 1967 | 101 7 29 | 1965 |
| | α Aquilæ W. | 54 10 50 | 3308 | 55 34 52 | 3244 | 57 0 9 | 3185 | 58 26 36 | 3133 |
| | α Arietis E. | 53 56 32 | 9115 | 52 5 55 | 9118 | 50 15 23 | 9123 | 48 24 59 | 9131 |
| | Aldebaran E. | 83 46 27 | 1993 | 81 52 42 | 1989 | 79 58 50 | 1986 | 78 4 54 | 1984 |
| | α Aquilæ W. | 65 52 41 | 9246 | 67 24 2 | 9230 | 68 55 55 | 9229 | 70 28 15 | 9221 |
| | Fomalhaut W. | 31 11 41 | 9646 | 32 49 34 | 9582 | 34 28 54 | 9527 | 36 9 29 | 9488 |
| 18 | JUPITER W. | 18 13 6 | 1992 | 20 6 53 | 1984 | 22 0 52 | 1979 | 23 55 0 | 1975 |
| | Aldebaran E. | 68 34 48 | 1987 | 66 40 53 | 1980 | 64 47 2 | 1964 | 62 53 18 | 1968 |
| | Pollux E. | 112 37 6 | 1960 | 110 42 29 | 1953 | 108 47 56 | 1956 | 106 53 28 | 1969 |
| | α Aquilæ W. | 78 14 25 | 9835 | 79 48 8 | 9833 | 81 21 53 | 9834 | 82 55 37 | 9838 |
| | Fomalhaut W. | 44 45 18 | 9348 | 46 30 7 | 9335 | 48 15 15 | 9326 | 50 0 37 | 9319 |
| | JUPITER W. | 33 26 2 | 1986 | 35 19 59 | 1991 | 37 13 47 | 1999 | 39 7 23 | 2007 |
| 19 | Aldebaran E. | 53 27 5 | 9039 | 51 34 31 | 9049 | 49 42 13 | 9061 | 47 50 14 | 9073 |
| | Pollux E. | 97 23 0 | 9000 | 95 29 26 | 9009 | 93 36 5 | 9018 | 91 42 59 | 9026 |
| | α Aquilæ W. | 90 42 15 | 9886 | 92 14 52 | 9901 | 93 47 10 | 9919 | 95 19 5 | 9938 |
| | Fomalhaut W. | 58 48 51 | 9317 | 60 34 25 | 9299 | 62 19 52 | 9288 | 64 5 10 | 9277 |
| | JUPITER W. | 48 31 45 | 9061 | 50 23 45 | 9073 | 52 15 26 | 9086 | 54 6 46 | 9100 |
| | α Pegasi W. | 42 59 48 | 3007 | 44 29 52 | 3002 | 46 0 52 | 2994 | 47 32 41 | 2981 |
| 20 | Aldebaran E. | 38 35 45 | 9154 | 36 46 8 | 9174 | 34 57 2 | 9196 | 33 8 29 | 9220 |
| | Pollux E. | 82 21 37 | 9086 | 80 30 17 | 9100 | 78 39 18 | 9114 | 76 48 40 | 9129 |
| | α Aquilæ W. | 102 51 47 | 3084 | 104 20 41 | 3098 | 105 48 57 | 3128 | 107 16 33 | 3163 |
| | Fomalhaut W. | 72 48 18 | 9391 | 74 32 6 | 9405 | 76 15 34 | 9419 | 77 58 42 | 9433 |
| | JUPITER W. | 63 17 54 | 9176 | 65 6 57 | 9193 | 66 55 35 | 9210 | 68 43 48 | 9227 |
| | α Pegasi W. | 55 19 56 | 2801 | 56 54 22 | 2794 | 58 28 58 | 2789 | 60 3 40 | 2786 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|--------------|----------------|-------------|----------------|--------------|----------------|--------------|----------------|
| 13 | Sun W. | 121° 25' 28" | 9667 | 123° 2' 52" | 9648 | 124° 40' 42" | 9699 | 126° 18' 57" | 9611 |
| | Spica W. | 89 55 12 | 9350 | 91 39 58 | 9339 | 93 25 11 | 9314 | 95 10 50 | 9296 |
| | Antares W. | 44 0 45 | 9359 | 45 45 29 | 9333 | 47 30 41 | 9313 | 49 16 21 | 9294 |
| | Fomalhaut E. | 42 21 47 | 9749 | 40 46 12 | 9761 | 39 10 53 | 9779 | 37 35 57 | 9801 |
| | JUPITER E. | 49 34 58 | 9308 | 47 49 10 | 9290 | 46 2 56 | 9273 | 44 16 17 | 9257 |
| | α Pegasi E. | 63 5 26 | 9851 | 61 32 4 | 9819 | 59 58 40 | 9851 | 58 25 18 | 9854 |
| | α Arietis E. | 104 14 24 | 9433 | 102 31 37 | 9413 | 100 48 21 | 9394 | 99 4 38 | 9375 |
| 14 | Sun W. | 134 36 22 | 9585 | 136 17 1 | 9508 | 137 58 3 | 9493 | 139 39 23 | 9477 |
| | Spica W. | 104 5 32 | 9211 | 105 53 43 | 9194 | 107 42 19 | 9179 | 109 31 18 | 9163 |
| | Antares W. | 58 11 29 | 9205 | 59 59 49 | 9188 | 61 48 35 | 9172 | 63 37 45 | 9156 |
| | JUPITER E. | 35 17 2 | 9179 | 33 28 3 | 9165 | 31 38 43 | 9153 | 29 49 4 | 9141 |
| | α Pegasi E. | 50 40 45 | 9916 | 49 8 47 | 9942 | 47 37 21 | 9971 | 46 6 32 | 9907 |
| | α Arietis E. | 90 19 21 | 9286 | 88 33 1 | 9270 | 86 46 18 | 9255 | 84 59 12 | 9239 |
| 15 | Antares W. | 72 49 25 | 9083 | 74 40 50 | 9070 | 76 32 35 | 9058 | 78 24 39 | 9047 |
| | α Arietis E. | 75 58 22 | 9174 | 74 9 15 | 9163 | 72 19 52 | 9153 | 70 30 14 | 9145 |
| | Aldebaran E. | 106 15 58 | 9101 | 104 25 1 | 9088 | 102 33 44 | 9076 | 100 42 8 | 9065 |
| 16 | Antares W. | 87 49 4 | 9000 | 89 42 39 | 1999 | 91 36 26 | 1986 | 93 30 23 | 1980 |
| | α Aquilæ W. | 48 49 49 | 3648 | 50 7 32 | 3549 | 51 27 2 | 3480 | 52 48 11 | 3390 |
| | α Arietis E. | 61 19 10 | 9115 | 59 28 34 | 9113 | 57 37 54 | 9119 | 55 47 13 | 9119 |
| | Aldebaran E. | 91 20 1 | 9017 | 89 26 53 | 9010 | 87 33 34 | 9003 | 85 40 5 | 1998 |
| 17 | Antares W. | 103 1 58 | 1963 | 104 56 30 | 1963 | 106 51 3 | 1963 | 108 45 36 | 1964 |
| | α Aquilæ W. | 59 54 6 | 3066 | 61 22 33 | 3044 | 62 51 51 | 3006 | 64 21 56 | 2974 |
| | α Arietis E. | 46 34 47 | 9140 | 44 44 49 | 9133 | 42 55 10 | 9127 | 41 5 53 | 9124 |
| | Aldebaran E. | 76 10 54 | 1989 | 74 16 52 | 1989 | 72 22 49 | 1962 | 70 28 47 | 1964 |
| 18 | α Aquilæ W. | 72 0 58 | 2866 | 73 34 0 | 2854 | 75 7 18 | 2845 | 76 40 47 | 2838 |
| | Fomalhaut W. | 37 51 8 | 2444 | 39 33 40 | 2419 | 41 16 58 | 2386 | 43 0 53 | 2365 |
| | JUPITER W. | 25 49 13 | 1974 | 27 43 29 | 1974 | 29 37 44 | 1976 | 31 31 56 | 1980 |
| | Aldebaran E. | 60 59 41 | 2005 | 59 6 14 | 2012 | 57 12 58 | 2020 | 55 19 55 | 2028 |
| | Pollux E. | 104 59 5 | 1974 | 103 4 50 | 1979 | 101 10 43 | 1986 | 99 16 46 | 1993 |
| 19 | α Aquilæ W. | 84 29 16 | 2843 | 86 2 48 | 2851 | 87 36 10 | 2860 | 89 9 20 | 2872 |
| | Fomalhaut W. | 51 46 9 | 2314 | 53 31 48 | 2312 | 55 17 30 | 2319 | 57 3 12 | 2314 |
| | JUPITER W. | 41 0 46 | 2016 | 42 53 55 | 2026 | 44 46 49 | 2037 | 46 39 26 | 2048 |
| | Aldebaran E. | 45 58 34 | 2088 | 44 7 16 | 2103 | 42 16 21 | 2118 | 40 25 50 | 2136 |
| | Pollux E. | 89 50 8 | 2038 | 87 57 33 | 2050 | 86 5 16 | 2061 | 84 13 17 | 2073 |
| 20 | α Aquilæ W. | 96 50 36 | 2959 | 98 21 40 | 2983 | 99 52 14 | 3008 | 101 22 17 | 3034 |
| | Fomalhaut W. | 65 50 16 | 2345 | 67 35 10 | 2355 | 69 19 49 | 2366 | 71 4 12 | 2378 |
| | JUPITER W. | 55 57 45 | 9115 | 57 48 22 | 9130 | 59 38 36 | 9145 | 61 28 27 | 9161 |
| | α Pegasi W. | 49 5 11 | 2865 | 50 38 15 | 2842 | 52 11 48 | 2825 | 53 45 43 | 2811 |
| | Aldebaran E. | 31 20 32 | 2246 | 29 33 13 | 2274 | 27 46 36 | 2304 | 26 0 43 | 2332 |
| | Pollux E. | 74 58 25 | 2144 | 73 8 33 | 2159 | 71 19 4 | 2175 | 69 29 59 | 2191 |
| 21 | α Aquilæ W. | 108 43 26 | 3200 | 110 9 35 | 3240 | 111 31 57 | 3282 | 112 59 30 | 3325 |
| | Fomalhaut W. | 79 41 29 | 2449 | 81 23 54 | 2465 | 83 5 56 | 2482 | 84 47 34 | 2499 |
| | JUPITER W. | 70 31 35 | 2245 | 72 18 56 | 2262 | 74 5 52 | 2279 | 75 52 22 | 2296 |
| | α Pegasi W. | 61 38 24 | 2788 | 63 13 8 | 2789 | 64 47 50 | 2793 | 66 22 27 | 2798 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | III ^h . | P. L. of Diff. | VI ^h . | P. L. of Diff. | IX ^h . | P. L. of Diff. |
|-------------------|-------------------------------|-----------|----------------|--------------------|----------------|-------------------|----------------|-------------------|----------------|
| 21 | Pollux E. | 67 41 18 | 2208 | 65 53 2 | 2225 | 64 5 12 | 2242 | 62 17 47 | 2260 |
| | Regulus E. | 103 58 35 | 2217 | 102 10 33 | 2235 | 100 22 57 | 2251 | 98 35 46 | 2269 |
| | Sun E. | 133 50 20 | 2532 | 132 9 51 | 2550 | 130 29 47 | 2567 | 128 50 7 | 2585 |
| 22 | Fomalhaut W. | 86 28 48 | 2517 | 88 9 37 | 2535 | 89 50 2 | 2553 | 91 30 1 | 2572 |
| | JUPITER W. | 77 38 25 | 2315 | 79 24 2 | 2334 | 81 9 12 | 2352 | 82 53 56 | 2371 |
| | α Pegasi W. | 67 56 57 | 2805 | 69 31 18 | 2813 | 71 5 29 | 2822 | 72 39 28 | 2832 |
| | α Arietis W. | 24 23 0 | 2918 | 25 54 56 | 2889 | 27 27 54 | 2832 | 29 1 40 | 2864 |
| | Pollux E. | 53 27 19 | 2350 | 51 42 33 | 2370 | 49 58 15 | 2389 | 48 14 24 | 2408 |
| | Regulus E. | 89 46 19 | 2358 | 88 1 44 | 2377 | 86 17 36 | 2396 | 84 33 55 | 2414 |
| | Sun E. | 120 37 55 | 2677 | 119 0 44 | 2696 | 117 23 59 | 2716 | 115 47 40 | 2735 |
| 23 | Fomalhaut W. | 99 43 25 | 2669 | 101 20 46 | 2690 | 102 57 39 | 2710 | 104 34 5 | 2732 |
| | JUPITER W. | 91 30 59 | 2462 | 93 13 6 | 2480 | 94 54 47 | 2498 | 96 36 3 | 2516 |
| | α Pegasi W. | 80 25 42 | 2897 | 81 58 5 | 2911 | 83 30 10 | 2927 | 85 1 55 | 2942 |
| | α Arietis W. | 36 56 56 | 2750 | 38 32 30 | 2750 | 40 8 4 | 2751 | 41 43 36 | 2755 |
| | Pollux E. | 39 41 52 | 2502 | 38 0 42 | 2521 | 36 19 58 | 2540 | 34 39 41 | 2560 |
| | Regulus E. | 76 2 3 | 2507 | 74 20 59 | 2525 | 72 40 20 | 2543 | 71 0 7 | 2563 |
| | Sun E. | 107 52 29 | 2832 | 106 18 43 | 2852 | 104 45 22 | 2871 | 103 12 26 | 2891 |
| 24 | α Pegasi W. | 92 35 27 | 3029 | 94 5 4 | 3047 | 95 34 18 | 3066 | 97 3 9 | 3085 |
| | α Arietis W. | 49 39 27 | 2792 | 51 14 6 | 2801 | 52 48 32 | 2811 | 54 22 45 | 2822 |
| | Aldebaran W. | 18 58 9 | 2878 | 20 30 56 | 2882 | 22 4 3 | 2882 | 23 37 24 | 2845 |
| | Regulus E. | 62 45 17 | 2851 | 61 7 31 | 2869 | 59 30 9 | 2886 | 57 53 10 | 2703 |
| | Sun E. | 95 33 49 | 2984 | 94 3 16 | 3001 | 92 33 5 | 3019 | 91 3 16 | 3037 |
| 25 | α Arietis W. | 62 10 20 | 2877 | 63 43 8 | 2889 | 65 15 41 | 2899 | 66 48 1 | 2911 |
| | Aldebaran W. | 31 24 51 | 2855 | 32 58 7 | 2862 | 34 31 15 | 2869 | 36 4 14 | 2877 |
| | Regulus E. | 49 53 46 | 2784 | 48 18 57 | 2800 | 46 44 29 | 2815 | 45 10 21 | 2831 |
| | Sun E. | 83 39 29 | 3120 | 82 11 44 | 3136 | 80 44 18 | 3151 | 79 17 10 | 3166 |
| 26 | α Arietis W. | 74 26 9 | 2965 | 75 57 6 | 2975 | 77 27 50 | 2985 | 78 58 22 | 2995 |
| | Aldebaran W. | 43 46 28 | 2920 | 45 18 22 | 2929 | 46 50 4 | 2938 | 48 21 35 | 2946 |
| | Regulus E. | 37 24 35 | 2905 | 35 52 23 | 2920 | 34 20 29 | 2935 | 32 48 54 | 2950 |
| | Sun E. | 72 5 51 | 3236 | 70 40 24 | 3248 | 69 15 12 | 3261 | 67 50 15 | 3273 |
| 27 | α Arietis W. | 86 27 59 | 3041 | 87 57 21 | 3050 | 89 26 32 | 3058 | 90 55 33 | 3066 |
| | Aldebaran W. | 55 56 33 | 2987 | 57 27 2 | 2994 | 58 57 22 | 3001 | 60 27 33 | 3008 |
| | Sun E. | 60 48 52 | 3328 | 59 25 13 | 3338 | 58 1 45 | 3347 | 56 38 28 | 3356 |
| 28 | α Arietis W. | 98 18 14 | 3104 | 99 46 19 | 3110 | 101 14 16 | 3117 | 102 42 5 | 3124 |
| | Aldebaran W. | 67 56 25 | 3039 | 69 25 49 | 3045 | 70 55 6 | 3050 | 72 24 17 | 3055 |
| | Pollux W. | 23 43 14 | 3034 | 25 12 45 | 3037 | 26 42 12 | 3040 | 28 11 35 | 3044 |
| | Sun E. | 49 44 33 | 3397 | 48 22 13 | 3405 | 47 0 2 | 3412 | 45 37 59 | 3418 |
| 29 | Aldebaran W. | 79 48 47 | 3076 | 81 17 26 | 3079 | 82 46 1 | 3082 | 84 14 32 | 3085 |
| | Pollux W. | 35 37 26 | 3060 | 37 6 25 | 3063 | 38 35 20 | 3065 | 40 4 12 | 3069 |
| | Sun E. | 38 49 31 | 3448 | 37 28 9 | 3454 | 36 6 54 | 3460 | 34 45 45 | 3465 |
| 30 | Aldebaran W. | 91 36 19 | 3097 | 93 4 32 | 3098 | 94 32 44 | 3100 | 96 0 54 | 3100 |
| | Pollux W. | 47 27 50 | 3077 | 48 56 28 | 3078 | 50 25 4 | 3079 | 51 53 39 | 3081 |
| | Sun E. | 28 1 29 | 3493 | 26 40 57 | 3498 | 25 20 31 | 3506 | 24 0 13 | 3513 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|----|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
| 21 | Pollux | E. | 60° 30' 49" | 2278 | 58° 44' 17" | 2296 | 56° 58' 11" | 2314 | 55° 12' 32" | 2332 |
| | Regulus | E. | 96 49 1 | 2287 | 95 2 42 | 2304 | 93 16 48 | 2322 | 91 31 20 | 2340 |
| | SUN | E. | 127 10 51 | 2603 | 125 32 0 | 2621 | 123 53 33 | 2639 | 122 15 31 | 2658 |
| 22 | Fomalhaut | W. | 93 9 35 | 2591 | 94 48 42 | 2610 | 96 27 23 | 2630 | 98 5 37 | 2649 |
| | JUPITER | W. | 84 38 13 | 2389 | 86 22 4 | 2408 | 88 5 28 | 2426 | 89 48 26 | 2443 |
| | α Pegasi | W. | 74 13 14 | 2644 | 75 46 45 | 2655 | 77 20 1 | 2669 | 78 53 0 | 2682 |
| | α Arietis | W. | 30 36 3 | 2783 | 32 10 53 | 2768 | 33 46 3 | 2758 | 35 21 26 | 2753 |
| | Pollux | E. | 46 31 0 | 2496 | 44 48 3 | 2445 | 43 5 33 | 2464 | 41 23 29 | 2483 |
| | Regulus | E. | 82 50 40 | 2432 | 81 7 51 | 2451 | 79 25 29 | 2470 | 77 43 33 | 2488 |
| | SUN | E. | 114 11 47 | 2754 | 112 36 19 | 2774 | 111 1 17 | 2793 | 109 26 40 | 2813 |
| 23 | Fomalhaut | W. | 106 10 3 | 2753 | 107 45 33 | 2773 | 109 20 36 | 2795 | 110 55 11 | 2817 |
| | JUPITER | W. | 98 16 54 | 2534 | 99 57 20 | 2551 | 101 37 22 | 2569 | 103 17 0 | 2586 |
| | α Pegasi | W. | 86 33 20 | 2659 | 88 4 24 | 2676 | 89 35 7 | 2693 | 91 5 28 | 2711 |
| | α Arietis | W. | 43 19 3 | 2760 | 44 54 23 | 2766 | 46 29 35 | 2773 | 48 4 36 | 2782 |
| | Pollux | E. | 32 59 51 | 2579 | 31 20 27 | 2598 | 29 41 20 | 2617 | 28 2 57 | 2637 |
| | Regulus | E. | 69 20 20 | 2580 | 67 40 58 | 2598 | 66 2 0 | 2615 | 64 23 26 | 2634 |
| | SUN | E. | 101 39 55 | 2909 | 100 7 48 | 2928 | 98 36 5 | 2946 | 97 4 45 | 2965 |
| 24 | α Pegasi | W. | 98 31 37 | 3105 | 99 59 41 | 3124 | 101 27 21 | 3144 | 102 54 37 | 3164 |
| | α Arietis | W. | 55 56 44 | 2832 | 57 30 30 | 2844 | 59 4 1 | 2855 | 60 37 18 | 2866 |
| | Aldebaran | W. | 25 10 53 | 2843 | 26 44 26 | 2843 | 28 17 58 | 2845 | 29 51 27 | 2849 |
| | Regulus | E. | 56 16 33 | 2719 | 54 40 18 | 2736 | 53 4 26 | 2752 | 51 28 55 | 2769 |
| | SUN | E. | 89 33 49 | 3054 | 88 4 43 | 3071 | 86 35 58 | 3087 | 85 7 33 | 3105 |
| 25 | α Arietis | W. | 68 20 6 | 2921 | 69 51 58 | 2933 | 71 23 35 | 2943 | 72 54 59 | 2954 |
| | Aldebaran | W. | 37 37 2 | 2885 | 39 9 40 | 2894 | 40 42 7 | 2902 | 42 14 23 | 2911 |
| | Regulus | E. | 43 36 33 | 2846 | 42 3 5 | 2861 | 40 29 56 | 2876 | 38 57 6 | 2891 |
| | SUN | E. | 77 50 20 | 3180 | 76 23 47 | 3195 | 74 57 32 | 3209 | 73 31 33 | 3223 |
| 26 | α Arietis | W. | 80 28 41 | 3005 | 81 58 48 | 3014 | 83 28 43 | 3023 | 84 58 27 | 3033 |
| | Aldebaran | W. | 49 52 56 | 2954 | 51 24 6 | 2963 | 52 55 5 | 2971 | 54 25 54 | 2979 |
| | Regulus | E. | 31 17 39 | 2965 | 29 46 43 | 2981 | 28 16 6 | 2997 | 26 45 50 | 3014 |
| | SUN | W. | 66 25 32 | 3284 | 65 1 2 | 3296 | 63 36 46 | 3307 | 62 12 43 | 3319 |
| 27 | α Arietis | W. | 92 24 24 | 3074 | 93 53 5 | 3082 | 95 21 37 | 3089 | 96 50 0 | 3096 |
| | Aldebaran | W. | 61 57 36 | 3015 | 63 27 30 | 3022 | 64 57 16 | 3028 | 66 26 54 | 3034 |
| | SUN | E. | 55 15 21 | 3365 | 53 52 25 | 3373 | 52 29 38 | 3382 | 51 7 1 | 3390 |
| 28 | α Arietis | W. | 104 9 46 | 3130 | 105 37 19 | 3138 | 107 4 45 | 3143 | 108 32 3 | 3148 |
| | Aldebaran | W. | 73 53 22 | 3060 | 75 22 21 | 3064 | 76 51 15 | 3069 | 78 20 3 | 3072 |
| | Pollux | W. | 29 40 53 | 3047 | 31 10 7 | 3051 | 32 39 17 | 3054 | 34 8 23 | 3056 |
| | SUN | E. | 44 16 3 | 3424 | 42 54 14 | 3431 | 41 32 33 | 3438 | 40 10 59 | 3443 |
| 29 | Aldebaran | W. | 85 43 0 | 3088 | 87 11 24 | 3091 | 88 39 45 | 3093 | 90 8 3 | 3095 |
| | Pollux | W. | 41 33 0 | 3070 | 43 1 46 | 3073 | 44 30 29 | 3074 | 45 59 10 | 3075 |
| | SUN | E. | 33 24 42 | 3470 | 32 3 44 | 3476 | 30 42 53 | 3481 | 29 22 8 | 3487 |
| 30 | Aldebaran | W. | 97 29 2 | 3102 | 98 57 9 | 3103 | 100 25 15 | 3104 | 101 53 20 | 3105 |
| | Pollux | W. | 53 22 12 | 3081 | 54 50 45 | 3082 | 56 19 17 | 3082 | 57 47 49 | 3082 |
| | SUN | E. | 22 40 3 | 3521 | 21 20 2 | 3531 | 20 0 12 | 3540 | 18 40 34 | 3555 |

AT GREENWICH APPARENT NOON.

| AT GREENWICH APPARENT NOON. | | | | | | | | | | |
|-----------------------------|-------------------|--|-------------------|-----------------------|-------------------|----------------|--|--|-------------------|--|
| Day of the Week. | Day of the Month. | THE SUN'S | | | | | Sidereal Time of Semi-diameter Passing Meridian. | Equation of Time, to be Subtracted from Apparent Time. | Diff. for 1 Hour. | |
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | Semi-diameter. | | | | |
| Thur. | 1 | ^h 12 ^m 29 ^s 24.00 | 9.058 | S. 3° 10' 36".6 | -58.28 | 16' 1.35 | 64.35 | ^m 10 ^s 17.91 | 0.797 | |
| Frid. | 2 | 12 33 1.55 | 9.071 | 3 33 54.5 | 58.20 | 16 1.62 | 64.39 | 10 36.86 | 0.784 | |
| Sat. | 3 | 12 36 39.41 | 9.084 | 3 57 10.0 | 58.09 | 16 1.90 | 64.44 | 10 55.50 | 0.771 | |
| SUN. | 4 | 12 40 17.59 | 9.098 | 4 20 22.8 | -57.97 | 16 2.19 | 64.49 | 11 13.83 | 0.757 | |
| Mon. | 5 | 12 43 56.11 | 9.113 | 4 43 32.5 | 57.83 | 16 2.47 | 64.54 | 11 31.81 | 0.742 | |
| Tues. | 6 | 12 47 35.00 | 9.128 | 5 6 38.6 | 57.67 | 16 2.75 | 64.60 | 11 49.42 | 0.727 | |
| Wed. | 7 | 12 51 14.27 | 9.144 | 5 29 40.9 | -57.50 | 16 3.03 | 64.66 | 12 6.66 | 0.711 | |
| Thur. | 8 | 12 54 53.93 | 9.161 | 5 52 38.9 | 57.31 | 16 3.32 | 64.72 | 12 23.51 | 0.694 | |
| Frid. | 9 | 12 58 34.01 | 9.179 | 6 15 32.1 | 57.11 | 16 3.60 | 64.79 | 12 39.94 | 0.676 | |
| Sat. | 10 | 13 2 14.52 | 9.197 | 6 38 20.2 | -56.89 | 16 3.88 | 64.86 | 12 55.94 | 0.658 | |
| SUN. | 11 | 13 5 55.48 | 9.216 | 7 1 2.9 | 56.66 | 16 4.16 | 64.93 | 13 11.49 | 0.639 | |
| Mon. | 12 | 13 9 36.91 | 9.236 | 7 23 39.8 | 56.41 | 16 4.44 | 65.00 | 13 26.57 | 0.619 | |
| Tues. | 13 | 13 13 18.84 | 9.257 | 7 46 10.5 | -56.14 | 16 4.72 | 65.07 | 13 41.15 | 0.598 | |
| Wed. | 14 | 13 17 1.27 | 9.279 | 8 8 34.6 | 55.86 | 16 5.00 | 65.15 | 13 55.23 | 0.576 | |
| Thur. | 15 | 13 20 41.23 | 9.301 | 8 30 51.9 | 55.56 | 16 5.28 | 65.23 | 14 8.79 | 0.554 | |
| Frid. | 16 | 13 24 27.74 | 9.325 | 8 53 1.9 | -55.25 | 16 5.56 | 65.31 | 14 21.79 | 0.530 | |
| Sat. | 17 | 13 28 11.83 | 9.349 | 9 15 4.2 | 54.93 | 16 5.83 | 65.40 | 14 34.23 | 0.506 | |
| SUN. | 18 | 13 31 56.51 | 9.374 | 9 36 58.6 | 54.60 | 16 6.10 | 65.49 | 14 46.07 | 0.481 | |
| Mon. | 19 | 13 35 41.81 | 9.400 | 9 58 44.6 | -54.24 | 16 6.37 | 65.58 | 14 57.30 | 0.455 | |
| Tues. | 20 | 13 39 27.73 | 9.427 | 10 20 21.8 | 53.87 | 16 6.64 | 65.67 | 15 7.90 | 0.428 | |
| Wed. | 21 | 13 43 14.32 | 9.455 | 10 41 49.9 | 53.48 | 16 6.90 | 65.77 | 15 17.84 | 0.400 | |
| Thur. | 22 | 13 47 1.59 | 9.483 | 11 3 8.6 | -53.08 | 16 7.17 | 65.87 | 15 27.11 | 0.372 | |
| Frid. | 23 | 13 50 49.54 | 9.513 | 11 24 17.6 | 52.66 | 16 7.43 | 65.97 | 15 35.69 | 0.343 | |
| Sat. | 24 | 13 54 38.20 | 9.543 | 11 45 16.4 | 52.23 | 16 7.69 | 66.07 | 15 43.56 | 0.313 | |
| SUN. | 25 | 13 58 27.59 | 9.573 | 12 6 4.5 | -51.78 | 16 7.95 | 66.17 | 15 50.71 | 0.283 | |
| Mon. | 26 | 14 2 17.71 | 9.604 | 12 26 41.7 | 51.31 | 16 8.21 | 66.27 | 15 57.13 | 0.252 | |
| Tues. | 27 | 14 6 8.59 | 9.636 | 12 47 7.5 | 50.83 | 16 8.46 | 66.38 | 16 2.79 | 0.220 | |
| Wed. | 28 | 14 10 0.23 | 9.668 | 13 7 21.5 | -50.32 | 16 8.71 | 66.49 | 16 7.69 | 0.188 | |
| Thur. | 29 | 14 13 52.64 | 9.700 | 13 27 23.2 | 49.80 | 16 8.96 | 66.60 | 16 11.82 | 0.156 | |
| Frid. | 30 | 14 17 45.83 | 9.733 | 13 47 12.3 | 49.26 | 16 9.21 | 66.71 | 16 15.17 | 0.123 | |
| Sat. | 31 | 14°21 39.81 | 9.766 | 14 6 48.3 | 48.71 | 16 9.46 | 66.82 | 16 17.74 | 0.090 | |
| SUN. | 32 | 14 25 34.58 | 9.799 | S. 14 26 10.8 | -48.14 | 16 9.71 | 66.93 | 16 19.52 | 0.057 | |

NOTE.—The mean time of semidiameter passing may be found by subtracting 0^s.18 from the sidereal time.

The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, to be Added to Mean Time. | Diff. for 1 Hour. | Sidereal Time, or Right Ascension of Mean Sun. |
|------------------|-------------------|--|-------------------|-----------------------|-------------------|---|-------------------|--|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | | | |
| Thur. | 1 | ^h 12 ^m 29 ^s 25.56 | 9.060 | S. 3° 10' 46.6" | -58.30 | ^m 10 ^s 18.04 | 0.797 | ^h 12 ^m 39 ^s 43.60 |
| Frid. | 2 | 12 33 3.16 | 9.073 | 3 31 4.8 | 58.21 | 10 37.00 | 0.784 | 12 43 40.16 |
| Sat. | 3 | 12 36 41.07 | 9.086 | 3 57 20.6 | 58.10 | 10 55.64 | 0.771 | 12 47 36.71 |
| SUN. | 4 | 12 40 19.30 | 9.100 | 4 20 33.7 | -57.98 | 11 13.97 | 0.757 | 12 51 33.27 |
| Mon. | 5 | 12 43 57.87 | 9.115 | 4 43 43.6 | 57.84 | 11 31.95 | 0.742 | 12 55 29.82 |
| Tues. | 6 | 12 47 36.81 | 9.130 | 5 6 50.0 | 57.68 | 11 49.56 | 0.727 | 12 59 26.37 |
| Wed. | 7 | 12 51 16.12 | 9.146 | 5 29 52.5 | -57.51 | 12 6.80 | 0.711 | 13 3 22.92 |
| Thur. | 8 | 12 54 55.83 | 9.163 | 5 52 50.7 | 57.32 | 12 23.65 | 0.694 | 13 7 19.48 |
| Frid. | 9 | 12 58 35.95 | 9.181 | 6 15 44.1 | 57.12 | 12 40.08 | 0.676 | 13 11 16.03 |
| Sat. | 10 | 13 2 16.51 | 9.199 | 6 38 32.4 | -56.90 | 12 56.08 | 0.658 | 13 15 12.59 |
| SUN. | 11 | 13 5 57.51 | 9.218 | 7 1 15.3 | 56.67 | 13 11.63 | 0.639 | 13 19 9.14 |
| Mon. | 12 | 13 9 38.99 | 9.238 | 7 23 52.4 | 56.42 | 13 26.71 | 0.619 | 13 23 5.70 |
| Tues. | 13 | 13 13 20.96 | 9.259 | 7 46 23.3 | -56.15 | 13 41.29 | 0.598 | 13 27 2.25 |
| Wed. | 14 | 13 17 3.43 | 9.281 | 8 8 47.5 | 55.87 | 13 55.37 | 0.576 | 13 30 58.80 |
| Thur. | 15 | 13 20 46.43 | 9.303 | 8 31 4.9 | 55.57 | 14 8.92 | 0.554 | 13 34 55.35 |
| Frid. | 16 | 13 24 29.98 | 9.327 | 8 53 15.0 | -55.26 | 14 21.92 | 0.530 | 13 38 51.90 |
| Sat. | 17 | 13 28 14.11 | 9.351 | 9 15 17.4 | 54.94 | 14 34.35 | 0.506 | 13 42 48.46 |
| SUN. | 18 | 13 31 58.83 | 9.376 | 9 37 11.9 | 54.60 | 14 46.19 | 0.481 | 13 46 45.02 |
| Mon. | 19 | 13 35 44.16 | 9.402 | 9 58 58.0 | -54.24 | 14 57.41 | 0.455 | 13 50 41.57 |
| Tues. | 20 | 13 39 30.12 | 9.429 | 10 20 35.3 | 53.87 | 15 8.01 | 0.428 | 13 54 38.13 |
| Wed. | 21 | 13 43 16.71 | 9.457 | 10 42 3.5 | 53.48 | 15 17.94 | 0.400 | 13 58 34.68 |
| Thur. | 22 | 13 47 4.04 | 9.485 | 11 3 22.3 | -53.08 | 15 27.20 | 0.372 | 14 2 31.24 |
| Frid. | 23 | 13 50 52.02 | 9.514 | 11 24 31.3 | 52.66 | 15 35.77 | 0.343 | 14 6 27.79 |
| Sat. | 24 | 13 54 40.71 | 9.544 | 11 45 30.1 | 52.23 | 15 43.64 | 0.313 | 14 10 24.35 |
| SUN. | 25 | 13 58 30.12 | 9.574 | 12 6 18.2 | -51.78 | 15 50.78 | 0.283 | 14 14 20.90 |
| Mon. | 26 | 14 2 20.27 | 9.605 | 12 26 55.3 | 51.31 | 15 57.19 | 0.252 | 14 18 17.46 |
| Tues. | 27 | 14 6 11.17 | 9.637 | 12 47 21.1 | 50.83 | 16 2.85 | 0.220 | 14 22 14.01 |
| Wed. | 28 | 14 10 2.83 | 9.669 | 13 7 35.0 | -50.32 | 16 7.74 | 0.188 | 14 26 10.57 |
| Thur. | 29 | 14 13 55.26 | 9.701 | 13 27 36.6 | 49.80 | 16 11.86 | 0.156 | 14 30 7.12 |
| Frid. | 30 | 14 17 48.47 | 9.734 | 13 47 25.6 | 49.26 | 16 15.20 | 0.123 | 14 34 3.67 |
| Sat. | 31 | 14 21 42.47 | 9.767 | 14 7 1.5 | 48.71 | 16 17.76 | 0.090 | 14 38 0.23 |
| SUN. | 32 | 14 25 37.26 | 9.800 | S. 14 26 23.9 | -48.14 | 16 19.53 | 0.057 | 14 41 56.79 |

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 hour,
+ 9°.8565.
(Table III.)

| AT GREENWICH MEAN NOON. | | | | | | | | |
|--|------------------|-----------------|------------|----------------------|-----------|--|----------------------|---|
| Day of the Month. | Day of the Year. | THE SUN'S | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 Hour. | Mean Time of Sidereal Noon. |
| | | TRUE LONGITUDE. | | Diff. for 1 Hour. | LATITUDE. | | | |
| | | λ | λ' | | | | | |
| 1 | 274 | 188° 0' 59.1 | 0 36.4 | 147.68 | + 0.46 | 0.0002928 | -51.7 | 11 ^h 18 ^m 24.96 ^s |
| 2 | 275 | 188 60 4.7 | 59 41.9 | 147.77 | 0.40 | 0.0001684 | 52.0 | 11 14 29.05 |
| 3 | 276 | 189 59 12.4 | 58 49.5 | 147.86 | 0.31 | 0.0000433 | 52.3 | 11 10 33.14 |
| 4 | 277 | 190 58 22.1 | 57 59.1 | 147.95 | + 0.20 | 9.9999175 | -52.6 | 11 6 37.23 |
| 5 | 278 | 191 57 33.7 | 57 10.6 | 148.03 | + 0.07 | 9.9997911 | 52.8 | 11 2 41.33 |
| 6 | 279 | 192 56 47.3 | 56 24.1 | 148.10 | - 0.06 | 9.9996643 | 53.0 | 10 58 45.42 |
| 7 | 280 | 193 56 2.8 | 55 39.5 | 148.18 | - 0.20 | 9.9995371 | -53.1 | 10 54 49.51 |
| 8 | 281 | 194 55 20.1 | 54 56.6 | 148.25 | 0.33 | 9.9994096 | 53.2 | 10 50 53.60 |
| 9 | 282 | 195 54 39.1 | 54 15.5 | 148.33 | 0.44 | 9.9992819 | 53.3 | 10 46 57.69 |
| 10 | 283 | 196 53 59.8 | 53 36.1 | 148.40 | - 0.53 | 9.9991540 | -53.2 | 10 43 1.79 |
| 11 | 284 | 197 53 22.3 | 52 58.5 | 148.47 | 0.60 | 9.9990264 | 53.1 | 10 39 5.88 |
| 12 | 285 | 198 52 46.6 | 52 22.7 | 148.54 | 0.65 | 9.9988992 | 52.9 | 10 35 9.97 |
| 13 | 286 | 199 52 12.7 | 51 48.7 | 148.62 | - 0.66 | 9.9987726 | -52.6 | 10 31 14.06 |
| 14 | 287 | 200 51 40.6 | 51 16.5 | 148.69 | 0.64 | 9.9986467 | 52.3 | 10 27 18.16 |
| 15 | 288 | 201 51 10.3 | 50 46.1 | 148.77 | 0.59 | 9.9985215 | 52.0 | 10 23 22.25 |
| 16 | 289 | 202 50 41.9 | 50 17.6 | 148.85 | - 0.52 | 9.9983971 | -51.6 | 10 19 26.34 |
| 17 | 290 | 203 50 15.5 | 49 51.0 | 148.93 | 0.42 | 9.9982737 | 51.2 | 10 15 30.43 |
| 18 | 291 | 204 49 51.0 | 49 26.4 | 149.01 | 0.30 | 9.9981514 | 50.7 | 10 11 34.53 |
| 19 | 292 | 205 49 28.5 | 49 3.8 | 149.10 | - 0.17 | 9.9980303 | -50.2 | 10 7 38.62 |
| 20 | 293 | 206 49 8.1 | 48 43.3 | 149.19 | - 0.04 | 9.9979103 | 49.8 | 10 3 42.71 |
| 21 | 294 | 207 48 50.0 | 48 25.0 | 149.28 | + 0.09 | 9.9977912 | 49.4 | 9 59 46.80 |
| 22 | 295 | 208 48 34.1 | 48 9.0 | 149.37 | + 0.21 | 9.9976732 | -49.0 | 9 55 50.88 |
| 23 | 296 | 209 48 20.4 | 47 55.2 | 149.47 | 0.32 | 9.9975562 | 48.7 | 9 51 54.97 |
| 24 | 297 | 210 48 8.9 | 47 43.6 | 149.56 | 0.40 | 9.9974401 | 48.3 | 9 47 59.06 |
| 25 | 298 | 211 47 59.7 | 47 34.3 | 149.66 | + 0.46 | 9.9973248 | -47.9 | 9 44 3.15 |
| 26 | 299 | 212 47 52.7 | 47 27.3 | 149.75 | 0.49 | 9.9972102 | 47.6 | 9 40 7.25 |
| 27 | 300 | 213 47 47.8 | 47 22.2 | 149.84 | 0.49 | 9.9970961 | 47.4 | 9 36 11.34 |
| 28 | 301 | 214 47 45.1 | 47 19.3 | 149.93 | + 0.46 | 9.9969825 | -47.2 | 9 32 15.43 |
| 29 | 302 | 215 47 44.6 | 47 18.7 | 150.02 | 0.40 | 9.9968694 | 47.0 | 9 28 19.52 |
| 30 | 303 | 216 47 46.2 | 47 20.2 | 150.11 | 0.31 | 9.9967568 | 46.8 | 9 24 23.61 |
| 31 | 304 | 217 47 49.9 | 47 23.7 | 150.19 | 0.20 | 9.9966446 | 46.7 | 9 20 27.70 |
| 32 | 305 | 218 47 55.5 | 47 29.1 | 150.27 | + 0.08 | 9.9965327 | -46.5 | 9 16 31.79 |
| NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^d .0. | | | | | | | | Diff. for 1 Hour, — 9 ^s .8296. (Table II.) |

GREENWICH MEAN TIME.

THE MOON'S

| Day of the Month. | SEMIDIAMETER. | | HORIZONTAL PARALLAX. | | | | UPPER TRANSIT. | | AGE. |
|-------------------|---------------|-----------|----------------------|-------------------|-----------|-------------------|---------------------------|-------------------|--------------|
| | Noon. | Midnight. | Noon. | Diff. for 1 Hour. | Midnight. | Diff. for 1 Hour. | Meridian of Greenwich. | Diff. for 1 Hour. | Noon. |
| | | | | | | | ^h ^m | ^m | ^d |
| 1 | 14' 43.6 | 14' 43.5 | 53' 56.1 | -0.10 | 53' 55.7 | +0.03 | 23 33.7 | 1.65 | 28.2 |
| 2 | 14 43.7 | 14 44.4 | 53 56.6 | +0.14 | 53 58.9 | 0.25 | 6 | | 29.2 |
| 3 | 14 45.3 | 14 46.6 | 54 2.4 | 0.35 | 54 7.2 | 0.46 | 0 13.2 | 1.66 | 0.5 |
| 4 | 14 48.3 | 14 50.3 | 54 13.3 | +0.57 | 54 20.7 | +0.67 | 0 53.4 | 1.71 | 1.5 |
| 5 | 14 52.7 | 14 55.4 | 54 29.4 | 0.79 | 54 39.5 | 0.90 | 1 35.2 | 1.79 | 2.5 |
| 6 | 14 58.6 | 15 2.1 | 54 51.0 | 1.02 | 55 3.9 | 1.15 | 2 19.3 | 1.90 | 3.5 |
| 7 | 15 6.0 | 15 10.4 | 55 18.4 | +1.27 | 55 34.4 | +1.40 | 3 6.6 | 2.04 | 4.5 |
| 8 | 15 15.2 | 15 20.4 | 55 52.0 | 1.53 | 56 11.2 | 1.66 | 3 57.5 | 2.19 | 5.5 |
| 9 | 15 26.0 | 15 32.0 | 56 31.8 | 1.78 | 56 53.9 | 1.90 | 4 51.8 | 2.31 | 6.5 |
| 10 | 15 38.4 | 15 45.0 | 57 17.2 | +2.00 | 57 41.7 | +2.08 | 5 48.6 | 2.39 | 7.5 |
| 11 | 15 51.9 | 15 58.9 | 58 6.9 | 2.12 | 58 32.5 | 2.14 | 6 46.5 | 2.40 | 8.5 |
| 12 | 16 5.8 | 16 12.7 | 58 58.1 | 2.12 | 59 23.3 | 2.06 | 7 44.0 | 2.36 | 9.5 |
| 13 | 16 19.2 | 16 25.3 | 59 47.3 | +1.94 | 60 9.6 | +1.77 | 8 39.9 | 2.29 | 10.5 |
| 14 | 16 30.7 | 16 35.4 | 60 29.6 | 1.55 | 60 46.6 | 1.27 | 9 34.1 | 2.23 | 11.5 |
| 15 | 16 39.0 | 16 41.5 | 60 59.9 | 0.94 | 61 9.1 | +0.59 | 10 26.8 | 2.19 | 12.5 |
| 16 | 16 42.8 | 16 42.7 | 61 13.8 | +0.19 | 61 13.6 | -0.22 | 11 19.1 | 2.19 | 13.5 |
| 17 | 16 41.4 | 16 38.7 | 61 8.6 | -0.62 | 60 58.8 | 1.01 | 12 11.9 | 2.23 | 14.5 |
| 18 | 16 34.8 | 16 29.8 | 60 44.5 | 1.36 | 60 26.2 | 1.68 | 13 6.1 | 2.29 | 15.5 |
| 19 | 16 23.9 | 16 17.1 | 60 4.3 | -1.95 | 59 39.6 | -2.15 | 14 2.1 | 2.37 | 16.5 |
| 20 | 16 9.8 | 16 2.2 | 59 12.8 | 2.30 | 58 44.6 | 2.39 | 14 59.7 | 2.41 | 17.5 |
| 21 | 15 54.3 | 15 46.3 | 58 15.6 | 2.42 | 57 46.5 | 2.40 | 15 57.8 | 2.40 | 18.5 |
| 22 | 15 38.6 | 15 31.1 | 57 18.0 | -2.34 | 56 50.4 | -2.24 | 16 54.8 | 2.32 | 19.5 |
| 23 | 15 24.0 | 15 17.3 | 56 24.3 | 2.11 | 55 59.9 | 1.96 | 17 49.2 | 2.19 | 20.5 |
| 24 | 15 11.2 | 15 5.7 | 55 37.5 | 1.78 | 55 17.3 | 1.59 | 18 40.0 | 2.04 | 21.5 |
| 25 | 15 0.9 | 14 56.7 | 54 59.5 | -1.39 | 54 44.1 | -1.19 | 19 27.3 | 1.90 | 22.5 |
| 26 | 14 53.1 | 14 50.3 | 54 31.0 | 0.99 | 54 20.5 | 0.79 | 20 11.2 | 1.78 | 23.5 |
| 27 | 14 48.1 | 14 46.4 | 54 12.2 | 0.60 | 54 6.2 | 0.41 | 20 52.8 | 1.70 | 24.5 |
| 28 | 14 45.3 | 14 44.9 | 54 2.4 | -0.24 | 54 0.7 | -0.07 | 21 32.8 | 1.66 | 25.5 |
| 29 | 14 44.9 | 14 45.4 | 54 0.9 | +0.09 | 54 2.8 | +0.23 | 22 12.3 | 1.66 | 26.5 |
| 30 | 14 46.4 | 14 47.8 | 54 6.3 | 0.36 | 54 11.4 | 0.48 | 22 52.3 | 1.69 | 27.5 |
| 31 | 14 49.5 | 14 51.6 | 54 17.7 | 0.58 | 54 25.3 | 0.68 | 23 33.6 | 1.77 | 28.5 |
| 32 | 14 53.9 | 14 56.5 | 54 33.9 | +0.77 | 54 43.6 | +0.85 | 6 | | 29.5 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|------------------------|--------------|------------------------|-------------|------------------|------------------------|---------------|------------------------|
| THURSDAY 1. | | | | | SATURDAY 3. | | | | |
| 0 | 11 35 22.53 | 1.7949 | N. 7 44 46.9 | 12.704 | 0 | 13 0 29.70 | 1.7743 | S. 2 44 10.2 | 13.222 |
| 1 | 11 37 10.17 | 1.7931 | 7 32 3.8 | 12.732 | 1 | 13 2 16.19 | 1.7754 | 2 57 23.3 | 13.214 |
| 2 | 11 38 57.71 | 1.7914 | 7 19 19.1 | 12.759 | 2 | 13 4 2.75 | 1.7765 | 3 10 35.9 | 13.206 |
| 3 | 11 40 45.14 | 1.7897 | 7 6 32.7 | 12.786 | 3 | 13 5 49.37 | 1.7776 | 3 23 48.0 | 13.197 |
| 4 | 11 42 32.47 | 1.7881 | 6 53 44.7 | 12.812 | 4 | 13 7 36.06 | 1.7788 | 3 36 59.6 | 13.187 |
| 5 | 11 44 19.71 | 1.7866 | 6 40 55.2 | 12.837 | 5 | 13 9 22.83 | 1.7801 | 3 50 10.5 | 13.177 |
| 6 | 11 46 6.86 | 1.7651 | 6 28 4.3 | 12.861 | 6 | 13 11 9.67 | 1.7814 | 4 3 20.8 | 13.167 |
| 7 | 11 47 53.92 | 1.7836 | 6 15 11.9 | 12.885 | 7 | 13 12 56.60 | 1.7828 | 4 16 30.5 | 13.155 |
| 8 | 11 49 40.89 | 1.7821 | 6 2 18.1 | 12.907 | 8 | 13 14 43.61 | 1.7842 | 4 29 39.4 | 13.142 |
| 9 | 11 51 27.77 | 1.7808 | 5 49 23.0 | 12.929 | 9 | 13 16 30.71 | 1.7857 | 4 42 47.5 | 13.128 |
| 10 | 11 53 14.58 | 1.7796 | 5 36 26.6 | 12.951 | 10 | 13 18 17.90 | 1.7873 | 4 55 54.8 | 13.114 |
| 11 | 11 55 1.32 | 1.7783 | 5 23 28.9 | 12.972 | 11 | 13 20 5.19 | 1.7890 | 5 9 1.2 | 13.099 |
| 12 | 11 56 47.98 | 1.7771 | 5 10 30.0 | 12.991 | 12 | 13 21 52.58 | 1.7907 | 5 22 6.7 | 13.084 |
| 13 | 11 58 34.57 | 1.7760 | 4 57 30.0 | 13.010 | 13 | 13 23 40.07 | 1.7924 | 5 35 11.3 | 13.067 |
| 14 | 12 0 21.10 | 1.7750 | 4 44 28.8 | 13.029 | 14 | 13 25 27.67 | 1.7942 | 5 48 14.8 | 13.050 |
| 15 | 12 2 7.57 | 1.7740 | 4 31 26.5 | 13.047 | 15 | 13 27 15.37 | 1.7960 | 6 1 17.3 | 13.032 |
| 16 | 12 3 53.98 | 1.7730 | 4 18 23.2 | 13.064 | 16 | 13 29 3.19 | 1.7980 | 6 14 18.7 | 13.014 |
| 17 | 12 5 40.33 | 1.7721 | 4 5 18.9 | 13.080 | 17 | 13 30 51.13 | 1.8000 | 6 27 19.0 | 12.995 |
| 18 | 12 7 26.63 | 1.7713 | 3 52 13.6 | 13.096 | 18 | 13 32 39.19 | 1.8020 | 6 40 18.1 | 12.974 |
| 19 | 12 9 12.89 | 1.7706 | 3 39 7.4 | 13.110 | 19 | 13 34 27.37 | 1.8041 | 6 53 15.9 | 12.953 |
| 20 | 12 10 59.10 | 1.7699 | 3 26 0.4 | 13.123 | 20 | 13 36 15.68 | 1.8063 | 7 6 12.5 | 12.931 |
| 21 | 12 12 45.27 | 1.7693 | 3 12 52.6 | 13.137 | 21 | 13 38 4.13 | 1.8086 | 7 19 7.7 | 12.908 |
| 22 | 12 14 31.41 | 1.7687 | 2 59 44.0 | 13.150 | 22 | 13 39 52.71 | 1.8109 | 7 32 1.5 | 12.885 |
| 23 | 12 16 17.51 | 1.7681 | N. 2 46 34.6 | 13.162 | 23 | 13 41 41.43 | 1.8139 | S. 7 44 53.9 | 12.869 |
| FRIDAY 2. | | | | | SUNDAY 4. | | | | |
| 0 | 12 18 3.58 | 1.7676 | N. 2 33 24.5 | 13.173 | 0 | 13 43 30.29 | 1.8155 | S. 7 57 44.9 | 12.837 |
| 1 | 12 19 49.63 | 1.7672 | 2 20 13.8 | 13.183 | 1 | 13 45 19.29 | 1.8180 | 8 10 34.3 | 12.810 |
| 2 | 12 21 35.65 | 1.7668 | 2 7 2.5 | 13.193 | 2 | 13 47 8.45 | 1.8206 | 8 23 22.1 | 12.783 |
| 3 | 12 23 21.65 | 1.7666 | 1 53 50.6 | 13.202 | 3 | 13 48 57.76 | 1.8232 | 8 36 8.3 | 12.756 |
| 4 | 12 25 7.64 | 1.7664 | 1 40 38.2 | 13.210 | 4 | 13 50 47.23 | 1.8258 | 8 48 52.8 | 12.728 |
| 5 | 12 26 53.62 | 1.7662 | 1 27 25.4 | 13.218 | 5 | 13 52 36.86 | 1.8284 | 9 1 35.6 | 12.699 |
| 6 | 12 28 39.59 | 1.7661 | 1 14 12.1 | 13.225 | 6 | 13 54 26.64 | 1.8311 | 9 14 16.7 | 12.669 |
| 7 | 12 30 25.55 | 1.7660 | 1 0 58.4 | 13.231 | 7 | 13 56 16.59 | 1.8340 | 9 26 55.9 | 12.638 |
| 8 | 12 32 11.51 | 1.7661 | 0 47 44.4 | 13.236 | 8 | 13 58 6.72 | 1.8369 | 9 39 33.2 | 12.606 |
| 9 | 12 33 57.48 | 1.7662 | 0 34 30.1 | 13.241 | 9 | 13 59 57.02 | 1.8398 | 9 52 8.6 | 12.574 |
| 10 | 12 35 43.45 | 1.7663 | 0 21 15.5 | 13.245 | 10 | 14 1 47.49 | 1.8428 | 10 4 42.1 | 12.541 |
| 11 | 12 37 29.43 | 1.7665 | N. 0 8 0.7 | 13.248 | 11 | 14 3 38.15 | 1.8458 | 10 17 13.5 | 12.506 |
| 12 | 12 39 15.43 | 1.7668 | S. 0 5 14.2 | 13.250 | 12 | 14 5 28.90 | 1.8489 | 10 29 42.8 | 12.471 |
| 13 | 12 41 1.45 | 1.7671 | 0 18 29.3 | 13.252 | 13 | 14 7 20.02 | 1.8521 | 10 42 10.0 | 12.436 |
| 14 | 12 42 47.48 | 1.7674 | 0 31 44.4 | 13.253 | 14 | 14 9 11.24 | 1.8553 | 10 54 35.1 | 12.399 |
| 15 | 12 44 33.53 | 1.7678 | 0 44 59.6 | 13.253 | 15 | 14 11 2.65 | 1.8585 | 11 6 57.9 | 12.361 |
| 16 | 12 46 19.61 | 1.7683 | 0 58 14.7 | 13.252 | 16 | 14 12 54.26 | 1.8618 | 11 19 18.4 | 12.323 |
| 17 | 12 48 5.73 | 1.7689 | 1 11 29.8 | 13.251 | 17 | 14 14 46.07 | 1.8652 | 11 31 36.6 | 12.283 |
| 18 | 12 49 51.88 | 1.7695 | 1 24 44.8 | 13.248 | 18 | 14 16 38.00 | 1.8687 | 11 43 52.4 | 12.243 |
| 19 | 12 51 38.07 | 1.7701 | 1 37 59.6 | 13.245 | 19 | 14 18 30.31 | 1.8722 | 11 56 5.8 | 12.202 |
| 20 | 12 53 24.30 | 1.7708 | 1 51 14.2 | 13.242 | 20 | 14 20 22.75 | 1.8757 | 12 8 16.7 | 12.161 |
| 21 | 12 55 10.57 | 1.7716 | 2 4 28.7 | 13.239 | 21 | 14 22 15.40 | 1.8793 | 12 20 25.1 | 12.118 |
| 22 | 12 56 56.89 | 1.7725 | 2 17 42.9 | 13.234 | 22 | 14 24 8.27 | 1.8830 | 12 32 30.9 | 12.074 |
| 23 | 12 58 43.27 | 1.7734 | 2 30 56.7 | 13.228 | 23 | 14 26 1.36 | 1.8867 | 12 44 34.0 | 12.029 |
| 24 | 13 0 29.70 | 1.7743 | S. 2 44 10.2 | 13.222 | 24 | 14 27 54.67 | 1.8904 | S. 12 56 34.4 | 11.983 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|------------|------------------|---------------------|------------------|---------------------|--------------|------------------|---------------------|------------------|---------------------|
| MONDAY 5. | | | | | WEDNESDAY 7. | | | | |
| 0 | 14 27 54.67 | 1.8904 | S. 12° 56' 34.4" | 11.983 | 0 | 16 3 53.69 | 2.1940 | S. 21° 21' 22.6" | 8.664 |
| 1 | 14 29 48.21 | 1.8942 | 13 8 32.0 | 11.937 | 1 | 16 6 1.30 | 2.1926 | 21 29 59.6 | 8.569 |
| 2 | 14 31 41.98 | 1.8981 | 13 20 26.9 | 11.891 | 2 | 16 8 9.24 | 2.1352 | 21 38 30.9 | 8.473 |
| 3 | 14 33 35.98 | 1.9020 | 13 32 18.9 | 11.843 | 3 | 16 10 17.52 | 2.1408 | 21 46 56.4 | 8.376 |
| 4 | 14 35 30.22 | 1.9060 | 13 44 8.0 | 11.793 | 4 | 16 12 26.14 | 2.1465 | 21 55 16.0 | 8.278 |
| 5 | 14 37 24.70 | 1.9101 | 13 55 54.1 | 11.743 | 5 | 16 14 35.10 | 2.1522 | 22 3 29.8 | 8.180 |
| 6 | 14 39 19.43 | 1.9142 | 14 7 37.2 | 11.692 | 6 | 16 16 44.40 | 2.1578 | 22 11 37.6 | 8.079 |
| 7 | 14 41 14.40 | 1.9183 | 14 19 17.2 | 11.640 | 7 | 16 18 54.04 | 2.1635 | 22 19 39.3 | 7.978 |
| 8 | 14 43 9.62 | 1.9225 | 14 30 54.0 | 11.588 | 8 | 16 21 4.02 | 2.1692 | 22 27 35.0 | 7.877 |
| 9 | 14 45 5.10 | 1.9267 | 14 42 27.7 | 11.535 | 9 | 16 23 14.35 | 2.1750 | 22 35 24.5 | 7.773 |
| 10 | 14 47 0.83 | 1.9310 | 14 53 58.2 | 11.480 | 10 | 16 25 25.02 | 2.1807 | 22 43 7.7 | 7.668 |
| 11 | 14 48 56.82 | 1.9353 | 15 5 25.3 | 11.424 | 11 | 16 27 36.03 | 2.1863 | 22 50 44.7 | 7.563 |
| 12 | 14 50 53.06 | 1.9396 | 15 16 49.0 | 11.367 | 12 | 16 29 47.38 | 2.1920 | 22 58 15.3 | 7.456 |
| 13 | 14 52 49.57 | 1.9441 | 15 28 9.3 | 11.310 | 13 | 16 31 59.07 | 2.1977 | 23 5 39.4 | 7.348 |
| 14 | 14 54 46.35 | 1.9486 | 15 39 26.2 | 11.252 | 14 | 16 34 11.10 | 2.2034 | 23 12 57.1 | 7.240 |
| 15 | 14 56 43.40 | 1.9531 | 15 50 39.5 | 11.192 | 15 | 16 36 23.48 | 2.2091 | 23 20 8.2 | 7.129 |
| 16 | 14 58 40.72 | 1.9577 | 16 1 49.2 | 11.132 | 16 | 16 38 36.20 | 2.2148 | 23 27 12.6 | 7.018 |
| 17 | 15 0 38.32 | 1.9623 | 16 12 55.3 | 11.070 | 17 | 16 40 49.26 | 2.2204 | 23 34 10.4 | 6.907 |
| 18 | 15 2 36.20 | 1.9670 | 16 23 57.6 | 11.007 | 18 | 16 43 2.65 | 2.2260 | 23 41 1.5 | 6.795 |
| 19 | 15 4 34.36 | 1.9717 | 16 34 56.1 | 10.944 | 19 | 16 45 16.38 | 2.2317 | 23 47 45.8 | 6.680 |
| 20 | 15 6 32.80 | 1.9764 | 16 45 50.9 | 10.881 | 20 | 16 47 30.45 | 2.2373 | 23 54 23.1 | 6.564 |
| 21 | 15 8 31.53 | 1.9812 | 16 56 41.8 | 10.816 | 21 | 16 49 44.86 | 2.2429 | 24 0 53.4 | 6.447 |
| 22 | 15 10 30.55 | 1.9861 | 17 7 28.8 | 10.749 | 22 | 16 51 59.60 | 2.2485 | 24 7 16.7 | 6.330 |
| 23 | 15 12 29.86 | 1.9909 | S. 17° 18' 11.7" | 10.681 | 23 | 16 54 14.68 | 2.2541 | S. 24° 13' 33.0" | 6.212 |
| TUESDAY 6. | | | | | THURSDAY 8. | | | | |
| 0 | 15 14 29.46 | 1.9958 | S. 17° 28' 50.5" | 10.613 | 0 | 16 56 30.09 | 2.2596 | S. 24° 19' 42.1" | 6.092 |
| 1 | 15 16 29.36 | 2.0008 | 17 39 25.2 | 10.544 | 1 | 16 58 45.83 | 2.2651 | 24 25 44.0 | 5.971 |
| 2 | 15 18 29.56 | 2.0058 | 17 49 55.8 | 10.474 | 2 | 17 1 1.90 | 2.2706 | 24 31 38.6 | 5.849 |
| 3 | 15 20 30.06 | 2.0108 | 18 0 22.1 | 10.402 | 3 | 17 3 18.30 | 2.2760 | 24 37 25.9 | 5.727 |
| 4 | 15 22 30.86 | 2.0159 | 18 10 44.1 | 10.330 | 4 | 17 5 35.02 | 2.2814 | 24 43 5.8 | 5.603 |
| 5 | 15 24 31.97 | 2.0211 | 18 21 1.7 | 10.256 | 5 | 17 7 52.07 | 2.2868 | 24 48 38.2 | 5.478 |
| 6 | 15 26 33.39 | 2.0262 | 18 31 14.8 | 10.182 | 6 | 17 10 9.44 | 2.2922 | 24 54 3.1 | 5.352 |
| 7 | 15 28 35.12 | 2.0314 | 18 41 23.5 | 10.107 | 7 | 17 12 27.13 | 2.2975 | 24 59 20.4 | 5.225 |
| 8 | 15 30 37.16 | 2.0366 | 18 51 27.6 | 10.030 | 8 | 17 14 45.14 | 2.3028 | 25 4 30.1 | 5.097 |
| 9 | 15 32 39.51 | 2.0418 | 19 1 27.1 | 9.952 | 9 | 17 17 3.46 | 2.3080 | 25 9 32.0 | 4.967 |
| 10 | 15 34 42.18 | 2.0471 | 19 11 21.9 | 9.874 | 10 | 17 19 22.10 | 2.3132 | 25 14 26.1 | 4.837 |
| 11 | 15 36 45.17 | 2.0524 | 19 21 12.0 | 9.795 | 11 | 17 21 41.04 | 2.3183 | 25 19 12.5 | 4.707 |
| 12 | 15 38 48.47 | 2.0577 | 19 30 57.3 | 9.714 | 12 | 17 24 0.29 | 2.3233 | 25 23 51.0 | 4.575 |
| 13 | 15 40 52.09 | 2.0631 | 19 40 37.7 | 9.632 | 13 | 17 26 19.84 | 2.3284 | 25 28 21.5 | 4.442 |
| 14 | 15 42 56.04 | 2.0686 | 19 50 13.2 | 9.550 | 14 | 17 28 39.70 | 2.3335 | 25 32 44.0 | 4.307 |
| 15 | 15 45 0.32 | 2.0741 | 19 59 43.7 | 9.466 | 15 | 17 30 59.86 | 2.3386 | 25 36 58.4 | 4.172 |
| 16 | 15 47 4.93 | 2.0795 | 20 9 9.1 | 9.381 | 16 | 17 33 20.31 | 2.3437 | 25 41 4.7 | 4.037 |
| 17 | 15 49 9.86 | 2.0849 | 20 18 29.4 | 9.295 | 17 | 17 35 41.06 | 2.3489 | 25 45 2.8 | 3.900 |
| 18 | 15 51 15.12 | 2.0904 | 20 27 44.5 | 9.207 | 18 | 17 38 2.10 | 2.3531 | 25 48 52.7 | 3.762 |
| 19 | 15 53 20.71 | 2.0960 | 20 36 54.3 | 9.119 | 19 | 17 40 23.43 | 2.3578 | 25 52 34.3 | 3.623 |
| 20 | 15 55 26.64 | 2.1016 | 20 45 58.8 | 9.031 | 20 | 17 42 45.03 | 2.3624 | 25 56 7.5 | 3.483 |
| 21 | 15 57 32.90 | 2.1071 | 20 54 58.0 | 8.941 | 21 | 17 45 6.91 | 2.3670 | 25 59 32.3 | 3.343 |
| 22 | 15 59 39.49 | 2.1127 | 21 3 51.7 | 8.849 | 22 | 17 47 29.07 | 2.3715 | 26 2 48.6 | 3.202 |
| 23 | 16 1 46.42 | 2.1183 | 21 12 39.9 | 8.757 | 23 | 17 49 51.49 | 2.3759 | 26 5 56.5 | 3.060 |
| 24 | 16 3 53.69 | 2.1240 | S. 21° 21' 22.6" | 8.661 | 24 | 17 52 14.18 | 2.3803 | S. 26° 8' 55.8" | 2.916 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|--|------------------------|------------------|------------------------|------------|--|------------------------|------------------|------------------------|
| FRIDAY 9. | | | | | SUNDAY 11. | | | | |
| 0 | ^h 17 ^m 52 ^s 14.18 | 2.3803 | S. 26° 8' 55.8" | 2.916 | 0 | ^h 19 ^m 49 ^s 56.82 | 2.4872 | S. 25° 31' 15.8" | 4.646 |
| 1 | 17 54 37.13 | 2.3847 | 26 11 46.4 | 2.772 | 1 | 19 52 26.05 | 2.4871 | 25 26 32.1 | 4.809 |
| 2 | 17 57 0.34 | 2.3890 | 26 14 28.4 | 2.627 | 2 | 19 54 55.27 | 2.4868 | 25 21 38.7 | 4.971 |
| 3 | 17 59 23.81 | 2.3933 | 26 17 1.7 | 2.482 | 3 | 19 57 24.47 | 2.4865 | 25 16 35.6 | 5.134 |
| 4 | 18 1 47.53 | 2.3973 | 26 19 26.2 | 2.335 | 4 | 19 59 53.65 | 2.4860 | 25 11 22.7 | 5.297 |
| 5 | 18 4 11.49 | 2.4013 | 26 21 41.9 | 2.187 | 5 | 20 2 22.79 | 2.4854 | 25 6 0.0 | 5.459 |
| 6 | 18 6 35.69 | 2.4053 | 26 23 48.7 | 2.039 | 6 | 20 4 51.89 | 2.4847 | 25 0 27.6 | 5.621 |
| 7 | 18 9 0.13 | 2.4092 | 26 25 46.6 | 1.890 | 7 | 20 7 20.95 | 2.4840 | 24 54 45.5 | 5.782 |
| 8 | 18 11 24.79 | 2.4132 | 26 27 35.5 | 1.740 | 8 | 20 9 49.97 | 2.4832 | 24 48 53.7 | 5.944 |
| 9 | 18 13 49.68 | 2.4166 | 26 29 15.4 | 1.589 | 9 | 20 12 18.94 | 2.4823 | 24 42 52.2 | 6.105 |
| 10 | 18 16 14.79 | 2.4203 | 26 30 46.2 | 1.438 | 10 | 20 14 47.85 | 2.4813 | 24 36 41.1 | 6.266 |
| 11 | 18 18 40.12 | 2.4239 | 26 32 8.0 | 1.287 | 11 | 20 17 16.70 | 2.4802 | 24 30 20.3 | 6.427 |
| 12 | 18 21 5.66 | 2.4273 | 26 33 20.7 | 1.135 | 12 | 20 19 45.48 | 2.4791 | 24 23 49.9 | 6.586 |
| 13 | 18 23 31.40 | 2.4307 | 26 34 24.2 | 0.981 | 13 | 20 22 14.19 | 2.4779 | 24 17 10.0 | 6.745 |
| 14 | 18 25 57.35 | 2.4341 | 26 35 18.4 | 0.827 | 14 | 20 24 42.82 | 2.4766 | 24 10 20.5 | 6.904 |
| 15 | 18 28 23.49 | 2.4372 | 26 36 3.4 | 0.672 | 15 | 20 27 11.38 | 2.4752 | 24 3 21.5 | 7.063 |
| 16 | 18 30 49.82 | 2.4403 | 26 36 39.1 | 0.517 | 16 | 20 29 39.85 | 2.4737 | 23 56 13.0 | 7.221 |
| 17 | 18 33 16.33 | 2.4433 | 26 37 5.5 | 0.362 | 17 | 20 32 8.22 | 2.4721 | 23 48 55.0 | 7.378 |
| 18 | 18 35 43.01 | 2.4462 | 26 37 22.5 | 0.205 | 18 | 20 34 36.50 | 2.4705 | 23 41 27.6 | 7.535 |
| 19 | 18 38 9.87 | 2.4491 | 26 37 30.1 | - 0.048 | 19 | 20 37 4.68 | 2.4688 | 23 33 50.8 | 7.691 |
| 20 | 18 40 36.90 | 2.4517 | 26 37 28.3 | + 0.109 | 20 | 20 39 32.76 | 2.4671 | 23 26 4.7 | 7.847 |
| 21 | 18 43 4.08 | 2.4543 | 26 37 17.0 | 0.967 | 21 | 20 42 0.73 | 2.4652 | 23 18 9.2 | 8.003 |
| 22 | 18 45 31.42 | 2.4569 | 26 36 56.2 | 0.826 | 22 | 20 44 28.59 | 2.4633 | 23 10 4.4 | 8.156 |
| 23 | 18 47 58.91 | 2.4594 | S. 26° 36' 25.9" | 0.585 | 23 | 20 46 56.33 | 2.4614 | S. 23° 1' 50.4" | 8.309 |
| SATURDAY 10. | | | | | MONDAY 12. | | | | |
| 0 | 18 50 26.55 | 2.4618 | S. 26° 35' 46.0" | 0.744 | 0 | 20 49 23.96 | 2.4595 | S. 22° 53' 27.3" | 8.462 |
| 1 | 18 52 54.33 | 2.4640 | 26 34 56.6 | 0.903 | 1 | 20 51 51.47 | 2.4574 | 22 44 55.0 | 8.615 |
| 2 | 18 55 22.23 | 2.4660 | 26 33 57.6 | 1.064 | 2 | 20 54 18.85 | 2.4552 | 22 36 13.5 | 8.767 |
| 3 | 18 57 50.25 | 2.4680 | 26 32 48.9 | 1.225 | 3 | 20 56 46.09 | 2.4529 | 22 27 23.0 | 8.917 |
| 4 | 19 0 18.39 | 2.4700 | 26 31 30.6 | 1.386 | 4 | 20 59 13.20 | 2.4507 | 22 18 23.5 | 9.067 |
| 5 | 19 2 46.65 | 2.4718 | 26 30 2.6 | 1.547 | 5 | 21 1 40.18 | 2.4485 | 22 9 15.0 | 9.217 |
| 6 | 19 5 15.01 | 2.4735 | 26 28 24.9 | 1.709 | 6 | 21 4 7.02 | 2.4462 | 21 59 57.5 | 9.365 |
| 7 | 19 7 43.47 | 2.4752 | 26 26 37.5 | 1.871 | 7 | 21 6 33.72 | 2.4438 | 21 50 31.2 | 9.512 |
| 8 | 19 10 12.03 | 2.4767 | 26 24 40.4 | 2.033 | 8 | 21 9 0.27 | 2.4414 | 21 40 56.1 | 9.657 |
| 9 | 19 12 40.68 | 2.4782 | 26 22 33.5 | 2.196 | 9 | 21 11 26.68 | 2.4389 | 21 31 12.3 | 9.802 |
| 10 | 19 15 9.41 | 2.4795 | 26 20 16.9 | 2.358 | 10 | 21 13 52.94 | 2.4363 | 21 21 19.8 | 9.947 |
| 11 | 19 17 38.22 | 2.4807 | 26 17 50.5 | 2.521 | 11 | 21 16 19.04 | 2.4337 | 21 11 18.6 | 10.091 |
| 12 | 19 20 7.09 | 2.4817 | 26 15 14.4 | 2.683 | 12 | 21 18 44.98 | 2.4311 | 21 1 8.9 | 10.233 |
| 13 | 19 22 36.02 | 2.4827 | 26 12 28.5 | 2.847 | 13 | 21 21 10.77 | 2.4285 | 20 50 50.6 | 10.375 |
| 14 | 19 25 5.02 | 2.4837 | 26 9 32.8 | 3.011 | 14 | 21 23 36.40 | 2.4258 | 20 40 23.9 | 10.515 |
| 15 | 19 27 34.07 | 2.4846 | 26 6 27.2 | 3.175 | 15 | 21 26 1.87 | 2.4231 | 20 29 48.8 | 10.654 |
| 16 | 19 30 3.17 | 2.4853 | 26 3 11.8 | 3.338 | 16 | 21 28 27.18 | 2.4204 | 20 19 5.4 | 10.792 |
| 17 | 19 32 32.30 | 2.4858 | 25 59 46.7 | 3.501 | 17 | 21 30 52.32 | 2.4177 | 20 8 13.7 | 10.930 |
| 18 | 19 35 1.46 | 2.4863 | 25 56 11.7 | 3.665 | 18 | 21 33 17.30 | 2.4149 | 19 57 13.8 | 11.067 |
| 19 | 19 37 30.65 | 2.4868 | 25 52 26.9 | 3.828 | 19 | 21 35 42.11 | 2.4121 | 19 46 5.7 | 11.202 |
| 20 | 19 39 59.87 | 2.4871 | 25 48 32.3 | 3.992 | 20 | 21 38 6.75 | 2.4093 | 19 34 49.6 | 11.335 |
| 21 | 19 42 29.10 | 2.4873 | 25 44 27.9 | 4.155 | 21 | 21 40 31.23 | 2.4065 | 19 23 25.5 | 11.468 |
| 22 | 19 44 58.34 | 2.4873 | 25 40 13.7 | 4.318 | 22 | 21 42 55.53 | 2.4036 | 19 11 53.4 | 11.600 |
| 23 | 19 47 27.58 | 2.4873 | 25 35 49.7 | 4.482 | 23 | 21 45 19.66 | 2.4007 | 19 0 13.5 | 11.730 |
| 24 | 19 49 56.82 | 2.4872 | S. 25° 31' 15.8" | 4.646 | 24 | 21 47 43.62 | 2.3979 | S. 18° 48' 25.8" | 11.859 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|--|---------------------|------------------|---------------------|--------------|--|---------------------|-----------------|---------------------|
| TUESDAY 13. | | | | | THURSDAY 15. | | | | |
| 0 | ^h 21 ^m 47 ^s 43.62 | 2.3979 | S. 18° 48' 25.8" | 11.859 | 0 | ^h 23 ^m 39 ^s 43.36 | 2.9804 | S. 7° 17' 15.1" | 16.398 |
| 1 | 21 50 7.41 | 2.3950 | 18 36 30.4 | 11.967 | 1 | 23 42 0.14 | 2.9790 | 7 0 54.0 | 16.377 |
| 2 | 21 52 31.02 | 2.3921 | 18 24 27.3 | 12.115 | 2 | 23 44 16.84 | 2.9777 | 6 44 29.8 | 16.487 |
| 3 | 21 54 54.46 | 2.3892 | 18 12 16.6 | 12.241 | 3 | 23 46 33.46 | 2.9764 | 6 28 2.7 | 16.475 |
| 4 | 21 57 17.72 | 2.3863 | 17 59 58.4 | 12.365 | 4 | 23 48 50.00 | 2.9751 | 6 11 32.8 | 16.521 |
| 5 | 21 59 40.81 | 2.3834 | 17 47 32.8 | 12.487 | 5 | 23 51 6.47 | 2.9738 | 5 55 0.2 | 16.565 |
| 6 | 22 2 3.73 | 2.3805 | 17 34 59.9 | 12.609 | 6 | 23 53 22.86 | 2.9727 | 5 38 25.0 | 16.607 |
| 7 | 22 4 26.47 | 2.3776 | 17 22 19.7 | 12.730 | 7 | 23 55 39.19 | 2.9717 | 5 21 47.3 | 16.647 |
| 8 | 22 6 49.04 | 2.3747 | 17 9 32.3 | 12.848 | 8 | 23 57 55.46 | 2.9707 | 5 5 7.3 | 16.685 |
| 9 | 22 9 11.43 | 2.3718 | 16 56 37.9 | 12.965 | 9 | 0 0 11.67 | 2.9697 | 4 48 25.1 | 16.722 |
| 10 | 22 11 33.65 | 2.3689 | 16 43 36.5 | 13.082 | 10 | 0 2 27.83 | 2.9689 | 4 31 40.7 | 16.757 |
| 11 | 22 13 55.70 | 2.3660 | 16 30 28.1 | 13.197 | 11 | 0 4 43.94 | 2.9681 | 4 14 54.3 | 16.789 |
| 12 | 22 16 17.57 | 2.3631 | 16 17 12.9 | 13.310 | 12 | 0 7 0.00 | 2.9673 | 3 58 6.0 | 16.820 |
| 13 | 22 18 39.27 | 2.3602 | 16 3 50.9 | 13.422 | 13 | 0 9 16.02 | 2.9666 | 3 41 15.9 | 16.848 |
| 14 | 22 21 0.80 | 2.3574 | 15 50 22.3 | 13.532 | 14 | 0 11 32.00 | 2.9660 | 3 24 24.2 | 16.874 |
| 15 | 22 23 22.16 | 2.3546 | 15 36 47.1 | 13.641 | 15 | 0 13 47.94 | 2.9654 | 3 7 31.0 | 16.899 |
| 16 | 22 25 43.35 | 2.3518 | 15 23 5.4 | 13.748 | 16 | 0 16 3.85 | 2.9650 | 2 50 36.3 | 16.922 |
| 17 | 22 28 4.38 | 2.3491 | 15 9 17.3 | 13.854 | 17 | 0 18 19.74 | 2.9646 | 2 33 40.3 | 16.943 |
| 18 | 22 30 25.24 | 2.3463 | 14 55 22.9 | 13.958 | 18 | 0 20 35.60 | 2.9642 | 2 16 43.1 | 16.962 |
| 19 | 22 32 45.93 | 2.3435 | 14 41 22.3 | 14.062 | 19 | 0 22 51.44 | 2.9639 | 1 59 44.8 | 16.979 |
| 20 | 22 35 6.46 | 2.3408 | 14 27 15.5 | 14.163 | 20 | 0 25 7.27 | 2.9637 | 1 42 45.6 | 16.994 |
| 21 | 22 37 26.83 | 2.3389 | 14 13 2.7 | 14.262 | 21 | 0 27 23.08 | 2.9635 | 1 25 45.5 | 17.007 |
| 22 | 22 39 47.04 | 2.3355 | 13 58 44.0 | 14.361 | 22 | 0 29 38.89 | 2.9635 | 1 8 44.7 | 17.018 |
| 23 | 22 42 7.09 | 2.3328 | S. 13° 44' 19.4" | 14.458 | 23 | 0 31 54.70 | 2.9634 | S. 0° 51' 43.3" | 17.027 |
| WEDNESDAY 14. | | | | | FRIDAY 16. | | | | |
| 0 | 22 44 26.98 | 2.3302 | S. 13° 29' 49.0" | 14.553 | 0 | 0 34 10.50 | 2.9634 | S. 0° 34' 41.5" | 17.033 |
| 1 | 22 46 46.72 | 2.3277 | 13 15 13.0 | 14.647 | 1 | 0 36 26.31 | 2.9636 | 0 17 39.3 | 17.039 |
| 2 | 22 49 6.30 | 2.3251 | 13 0 31.4 | 14.738 | 2 | 0 38 42.13 | 2.9638 | S. 0 0 36.8 | 17.042 |
| 3 | 22 51 25.73 | 2.3226 | 12 45 44.4 | 14.828 | 3 | 0 40 57.96 | 2.9640 | N. 0 16 25.8 | 17.043 |
| 4 | 22 53 45.01 | 2.3202 | 12 30 52.0 | 14.917 | 4 | 0 43 13.81 | 2.9643 | 0 33 28.4 | 17.042 |
| 5 | 22 56 4.15 | 2.3177 | 12 15 54.3 | 15.004 | 5 | 0 45 29.68 | 2.9647 | 0 50 30.8 | 17.038 |
| 6 | 22 58 23.14 | 2.3153 | 12 0 51.5 | 15.089 | 6 | 0 47 45.58 | 2.9652 | 1 7 33.0 | 17.033 |
| 7 | 23 0 41.99 | 2.3130 | 11 45 43.6 | 15.172 | 7 | 0 50 1.51 | 2.9657 | 1 24 34.8 | 17.027 |
| 8 | 23 3 0.70 | 2.3107 | 11 30 30.8 | 15.254 | 8 | 0 52 17.47 | 2.9662 | 1 41 36.2 | 17.018 |
| 9 | 23 5 19.27 | 2.3084 | 11 15 13.1 | 15.335 | 9 | 0 54 33.46 | 2.9668 | 1 58 37.0 | 17.007 |
| 10 | 23 7 37.70 | 2.3062 | 10 59 50.6 | 15.413 | 10 | 0 56 49.49 | 2.9676 | 2 15 37.1 | 16.994 |
| 11 | 23 9 56.01 | 2.3041 | 10 44 23.5 | 15.490 | 11 | 0 59 5.57 | 2.9684 | 2 32 36.3 | 16.979 |
| 12 | 23 12 14.19 | 2.3019 | 10 28 51.8 | 15.565 | 12 | 1 1 21.70 | 2.9692 | 2 49 34.6 | 16.962 |
| 13 | 23 14 32.24 | 2.2998 | 10 13 15.7 | 15.638 | 13 | 1 3 37.88 | 2.9702 | 3 6 31.8 | 16.943 |
| 14 | 23 16 50.17 | 2.2978 | 9 57 35.2 | 15.710 | 14 | 1 5 54.12 | 2.9712 | 3 23 27.8 | 16.922 |
| 15 | 23 19 7.98 | 2.2958 | 9 41 50.5 | 15.779 | 15 | 1 8 10.42 | 2.9722 | 3 40 22.4 | 16.898 |
| 16 | 23 21 25.67 | 2.2939 | 9 26 1.7 | 15.847 | 16 | 1 10 26.78 | 2.9732 | 3 57 15.6 | 16.873 |
| 17 | 23 23 43.25 | 2.2920 | 9 10 8.8 | 15.914 | 17 | 1 12 43.21 | 2.9744 | 4 14 7.2 | 16.847 |
| 18 | 23 26 0.71 | 2.2902 | 8 54 12.0 | 15.978 | 18 | 1 14 59.71 | 2.9756 | 4 30 57.2 | 16.818 |
| 19 | 23 28 18.07 | 2.2884 | 8 38 11.4 | 16.041 | 19 | 1 17 16.28 | 2.9769 | 4 47 45.4 | 16.787 |
| 20 | 23 30 35.32 | 2.2867 | 8 22 7.1 | 16.102 | 20 | 1 19 32.94 | 2.9783 | 5 4 31.6 | 16.753 |
| 21 | 23 32 52.47 | 2.2851 | 8 5 50.2 | 16.161 | 21 | 1 21 49.68 | 2.9797 | 5 21 15.8 | 16.718 |
| 22 | 23 35 9.53 | 2.2835 | 7 49 47.8 | 16.217 | 22 | 1 24 6.51 | 2.2812 | 5 37 57.8 | 16.682 |
| 23 | 23 37 26.49 | 2.2819 | 7 33 33.1 | 16.272 | 23 | 1 26 23.43 | 2.2827 | 5 54 37.6 | 16.643 |
| 24 | 23 39 43.36 | 2.2804 | S. 7° 17' 15.1" | 16.326 | 24 | 1 28 40.44 | 2.2843 | N. 6° 11' 15.0" | 16.602 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|----------------|---------------------|-------------|------------------|---------------------|---------------|---------------------|
| SATURDAY 17. | | | | | MONDAY 19. | | | | |
| 0 | 1 28 40.44 | 2.2843 | N. 6 11' 15.0" | 16.602 | 0 | 3 21 1.29 | 2.4079 | N. 18 5' 3.0" | 12.462 |
| 1 | 1 30 57.55 | 2.2860 | 6 27 49.9 | 16.559 | 1 | 3 23 25.85 | 2.4108 | 18 17 26.9 | 12.335 |
| 2 | 1 33 14.76 | 2.2877 | 6 44 22.1 | 16.514 | 2 | 3 25 50.59 | 2.4138 | 18 29 43.2 | 12.207 |
| 3 | 1 35 32.07 | 2.2894 | 7 0 51.6 | 16.467 | 3 | 3 28 15.51 | 2.4167 | 18 41 51.8 | 12.078 |
| 4 | 1 37 49.49 | 2.2912 | 7 17 18.2 | 16.418 | 4 | 3 30 40.60 | 2.4196 | 18 53 52.6 | 11.947 |
| 5 | 1 40 7.02 | 2.2931 | 7 33 41.8 | 16.367 | 5 | 3 33 5.86 | 2.4225 | 19 5 45.5 | 11.815 |
| 6 | 1 42 24.66 | 2.2950 | 7 50 2.3 | 16.315 | 6 | 3 35 31.30 | 2.4253 | 19 17 30.4 | 11.681 |
| 7 | 1 44 42.42 | 2.2970 | 8 6 19.6 | 16.260 | 7 | 3 37 56.90 | 2.4281 | 19 29 7.2 | 11.547 |
| 8 | 1 47 0.30 | 2.2991 | 8 22 33.5 | 16.203 | 8 | 3 40 22.67 | 2.4309 | 19 40 36.0 | 11.412 |
| 9 | 1 49 18.31 | 2.3012 | 8 38 44.0 | 16.145 | 9 | 3 42 48.61 | 2.4337 | 19 51 56.6 | 11.274 |
| 10 | 1 51 36.44 | 2.3033 | 8 54 50.9 | 16.084 | 10 | 3 45 14.71 | 2.4364 | 20 3 8.9 | 11.136 |
| 11 | 1 53 54.70 | 2.3055 | 9 10 54.1 | 16.023 | 11 | 3 47 40.98 | 2.4391 | 20 14 12.9 | 10.997 |
| 12 | 1 56 13.10 | 2.3077 | 9 26 53.6 | 15.959 | 12 | 3 50 7.41 | 2.4418 | 20 25 8.5 | 10.856 |
| 13 | 1 58 31.63 | 2.3100 | 9 42 49.2 | 15.892 | 13 | 3 52 34.00 | 2.4444 | 20 35 55.6 | 10.714 |
| 14 | 2 0 50.30 | 2.3123 | 9 58 40.7 | 15.823 | 14 | 3 55 0.74 | 2.4469 | 20 46 34.2 | 10.571 |
| 15 | 2 3 9.10 | 2.3146 | 10 14 28.0 | 15.753 | 15 | 3 57 27.63 | 2.4494 | 20 57 4.1 | 10.427 |
| 16 | 2 5 28.05 | 2.3171 | 10 30 11.1 | 15.682 | 16 | 3 59 54.67 | 2.4519 | 21 7 25.4 | 10.282 |
| 17 | 2 7 47.15 | 2.3195 | 10 45 49.8 | 15.608 | 17 | 4 2 21.86 | 2.4543 | 21 17 38.0 | 10.136 |
| 18 | 2 10 6.39 | 2.3219 | 11 1 24.1 | 15.533 | 18 | 4 4 49.19 | 2.4567 | 21 27 41.7 | 9.989 |
| 19 | 2 12 25.78 | 2.3245 | 11 16 53.8 | 15.456 | 19 | 4 7 16.06 | 2.4590 | 21 37 36.6 | 9.841 |
| 20 | 2 14 45.33 | 2.3271 | 11 32 18.8 | 15.376 | 20 | 4 9 44.27 | 2.4613 | 21 47 22.6 | 9.692 |
| 21 | 2 17 5.04 | 2.3297 | 11 47 38.9 | 15.294 | 21 | 4 12 12.02 | 2.4636 | 21 56 59.6 | 9.542 |
| 22 | 2 19 24.90 | 2.3323 | 12 2 54.1 | 15.212 | 22 | 4 14 39.90 | 2.4657 | 22 6 27.6 | 9.391 |
| 23 | 2 21 44.92 | 2.3350 | N. 12 18 4.3 | 15.127 | 23 | 4 17 7.90 | 2.4678 | N. 22 15 46.5 | 9.239 |
| SUNDAY 18. | | | | | TUESDAY 20. | | | | |
| 0 | 2 24 5.10 | 2.3377 | N. 12 33 9.4 | 15.041 | 0 | 4 19 36.03 | 2.4698 | N. 22 24 56.3 | 9.087 |
| 1 | 2 26 25.44 | 2.3404 | 12 48 9.2 | 14.952 | 1 | 4 22 4.28 | 2.4717 | 22 33 56.9 | 8.933 |
| 2 | 2 28 45.95 | 2.3432 | 13 3 3.7 | 14.862 | 2 | 4 24 32.64 | 2.4736 | 22 42 48.3 | 8.779 |
| 3 | 2 31 6.63 | 2.3461 | 13 17 52.7 | 14.771 | 3 | 4 27 1.11 | 2.4754 | 22 51 30.4 | 8.623 |
| 4 | 2 33 27.48 | 2.3488 | 13 32 36.2 | 14.677 | 4 | 4 29 29.69 | 2.4772 | 23 0 3.1 | 8.467 |
| 5 | 2 35 48.49 | 2.3516 | 13 47 14.0 | 14.582 | 5 | 4 31 58.37 | 2.4789 | 23 8 26.5 | 8.311 |
| 6 | 2 38 9.67 | 2.3545 | 14 1 46.0 | 14.484 | 6 | 4 34 27.16 | 2.4806 | 23 16 40.5 | 8.154 |
| 7 | 2 40 31.03 | 2.3574 | 14 16 12.1 | 14.386 | 7 | 4 36 56.04 | 2.4821 | 23 24 45.0 | 7.996 |
| 8 | 2 42 52.56 | 2.3603 | 14 30 32.3 | 14.286 | 8 | 4 39 25.01 | 2.4835 | 23 32 40.0 | 7.838 |
| 9 | 2 45 14.27 | 2.3632 | 14 44 46.4 | 14.183 | 9 | 4 41 54.06 | 2.4848 | 23 40 25.6 | 7.680 |
| 10 | 2 47 36.15 | 2.3662 | 14 58 54.3 | 14.079 | 10 | 4 44 23.19 | 2.4861 | 23 48 1.6 | 7.520 |
| 11 | 2 49 58.21 | 2.3692 | 15 12 55.9 | 13.974 | 11 | 4 46 52.40 | 2.4873 | 23 55 28.0 | 7.359 |
| 12 | 2 52 20.45 | 2.3722 | 15 26 51.2 | 13.867 | 12 | 4 49 21.67 | 2.4884 | 24 2 44.7 | 7.198 |
| 13 | 2 54 42.87 | 2.3752 | 15 40 40.0 | 13.758 | 13 | 4 51 51.01 | 2.4895 | 24 9 51.8 | 7.037 |
| 14 | 2 57 5.47 | 2.3781 | 15 54 22.2 | 13.648 | 14 | 4 54 20.41 | 2.4904 | 24 16 49.2 | 6.876 |
| 15 | 2 59 28.24 | 2.3811 | 16 7 57.8 | 13.537 | 15 | 4 56 49.86 | 2.4913 | 24 23 36.9 | 6.714 |
| 16 | 3 1 51.19 | 2.3840 | 16 21 26.6 | 13.423 | 16 | 4 59 19.36 | 2.4921 | 24 30 14.8 | 6.551 |
| 17 | 3 4 14.32 | 2.3871 | 16 34 48.6 | 13.308 | 17 | 5 1 48.91 | 2.4928 | 24 36 43.0 | 6.388 |
| 18 | 3 6 37.64 | 2.3901 | 16 48 3.6 | 13.191 | 18 | 5 4 18.49 | 2.4933 | 24 43 1.4 | 6.225 |
| 19 | 3 9 1.14 | 2.3931 | 17 1 11.5 | 13.073 | 19 | 5 6 48.10 | 2.4938 | 24 49 10.0 | 6.062 |
| 20 | 3 11 24.81 | 2.3960 | 17 14 12.4 | 12.955 | 20 | 5 9 17.74 | 2.4943 | 24 55 8.8 | 5.898 |
| 21 | 3 13 48.66 | 2.3990 | 17 27 6.1 | 12.834 | 21 | 5 11 47.41 | 2.4946 | 25 0 57.7 | 5.733 |
| 22 | 3 16 12.69 | 2.4020 | 17 39 52.5 | 12.712 | 22 | 5 14 17.09 | 2.4947 | 25 6 36.7 | 5.568 |
| 23 | 3 18 36.90 | 2.4050 | 17 52 31.5 | 12.588 | 23 | 5 16 46.77 | 2.4947 | 25 12 5.9 | 5.404 |
| 24 | 3 21 1.29 | 2.4079 | N. 18 5 3.0 | 12.462 | 24 | 5 19 16.45 | 2.4947 | N. 25 17 25.2 | 5.239 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|---|---------------------|---------------|---------------------|--------------|--|---------------------|---------------|---------------------|
| WEDNESDAY 21. | | | | | FRIDAY 23. | | | | |
| 0 | ^h 5 ^m 19 ^s 16.45 | 2.4947 | N. 25 17 25.2 | 5.239 | 0 | ^h 7 ^m 17 ^s 2.66 | 2.3745 | N. 26 22 3.4 | 2.372 |
| 1 | 5 21 46.13 | 2.4946 | 25 22 34.6 | 5.074 | 1 | 7 19 24.99 | 2.3698 | 26 19 36.8 | 2.515 |
| 2 | 5 24 15.80 | 2.4944 | 25 27 34.1 | 4.909 | 2 | 7 21 47.04 | 2.3651 | 26 17 1.6 | 2.657 |
| 3 | 5 26 45.46 | 2.4943 | 25 32 23.7 | 4.744 | 3 | 7 24 8.80 | 2.3602 | 26 14 17.9 | 2.799 |
| 4 | 5 29 15.10 | 2.4938 | 25 37 3.4 | 4.578 | 4 | 7 26 30.27 | 2.3553 | 26 11 25.7 | 2.940 |
| 5 | 5 31 44.71 | 2.4932 | 25 41 33.1 | 4.413 | 5 | 7 28 51.44 | 2.3503 | 26 8 25.1 | 3.079 |
| 6 | 5 34 14.28 | 2.4925 | 25 45 53.0 | 4.249 | 6 | 7 31 12.31 | 2.3453 | 26 5 16.2 | 3.218 |
| 7 | 5 36 43.81 | 2.4918 | 25 50 3.0 | 4.084 | 7 | 7 33 32.88 | 2.3403 | 26 1 50.0 | 3.356 |
| 8 | 5 39 13.30 | 2.4910 | 25 54 3.0 | 3.918 | 8 | 7 35 53.14 | 2.3352 | 25 58 33.5 | 3.492 |
| 9 | 5 41 42.73 | 2.4900 | 25 57 53.1 | 3.752 | 9 | 7 38 13.10 | 2.3300 | 25 54 59.9 | 3.627 |
| 10 | 5 44 12.10 | 2.4890 | 26 1 33.3 | 3.587 | 10 | 7 40 32.74 | 2.3247 | 25 51 18.2 | 3.762 |
| 11 | 5 46 41.41 | 2.4878 | 26 5 3.6 | 3.423 | 11 | 7 42 52.07 | 2.3195 | 25 47 28.4 | 3.897 |
| 12 | 5 49 10.64 | 2.4865 | 26 8 24.1 | 3.259 | 12 | 7 45 11.08 | 2.3142 | 25 43 30.6 | 4.030 |
| 13 | 5 51 39.79 | 2.4852 | 26 11 34.7 | 3.094 | 13 | 7 47 29.77 | 2.3088 | 25 39 24.8 | 4.162 |
| 14 | 5 54 8.86 | 2.4838 | 26 14 35.4 | 2.929 | 14 | 7 49 48.13 | 2.3033 | 25 35 11.2 | 4.292 |
| 15 | 5 56 37.84 | 2.4822 | 26 17 26.2 | 2.765 | 15 | 7 52 6.17 | 2.2979 | 25 30 49.8 | 4.421 |
| 16 | 5 59 6.72 | 2.4804 | 26 20 7.2 | 2.602 | 16 | 7 54 23.88 | 2.2924 | 25 26 20.7 | 4.550 |
| 17 | 6 1 35.49 | 2.4786 | 26 22 38.4 | 2.438 | 17 | 7 56 41.26 | 2.2869 | 25 21 43.8 | 4.678 |
| 18 | 6 4 4.15 | 2.4767 | 26 24 59.7 | 2.274 | 18 | 7 58 58.31 | 2.2813 | 25 16 59.3 | 4.804 |
| 19 | 6 6 32.70 | 2.4747 | 26 27 11.2 | 2.111 | 19 | 8 1 15.02 | 2.2757 | 25 12 7.3 | 4.930 |
| 20 | 6 9 1.12 | 2.4726 | 26 29 13.0 | 1.949 | 20 | 8 3 31.39 | 2.2701 | 25 7 7.7 | 5.055 |
| 21 | 6 11 29.41 | 2.4704 | 26 31 5.1 | 1.787 | 21 | 8 5 47.43 | 2.2645 | 25 2 0.7 | 5.178 |
| 22 | 6 13 57.56 | 2.4681 | 26 32 47.4 | 1.624 | 22 | 8 8 3.13 | 2.2588 | 24 56 46.4 | 5.300 |
| 23 | 6 16 25.58 | 2.4657 | N. 26 34 20.0 | 1.463 | 23 | 8 10 18.49 | 2.2531 | N. 24 51 24.7 | 5.422 |
| THURSDAY 22. | | | | | SATURDAY 24. | | | | |
| 0 | 6 18 53.45 | 2.4632 | N. 26 35 43.0 | 1.302 | 0 | 8 12 33.50 | 2.2473 | N. 24 45 55.7 | 5.543 |
| 1 | 6 21 21.16 | 2.4605 | 26 36 56.3 | 1.142 | 1 | 8 14 48.17 | 2.2416 | 24 40 19.5 | 5.669 |
| 2 | 6 23 48.71 | 2.4578 | 26 38 0.0 | 0.982 | 2 | 8 17 2.49 | 2.2358 | 24 34 36.2 | 5.780 |
| 3 | 6 26 16.10 | 2.4550 | 26 38 54.1 | 0.823 | 3 | 8 19 16.47 | 2.2301 | 24 28 45.9 | 5.897 |
| 4 | 6 28 43.31 | 2.4520 | 26 39 38.7 | 0.664 | 4 | 8 21 30.10 | 2.2243 | 24 22 48.6 | 6.013 |
| 5 | 6 31 10.34 | 2.4490 | 26 40 13.8 | 0.505 | 5 | 8 23 43.38 | 2.2184 | 24 16 44.3 | 6.128 |
| 6 | 6 33 37.19 | 2.4459 | 26 40 39.3 | 0.347 | 6 | 8 25 56.31 | 2.2126 | 24 10 33.2 | 6.242 |
| 7 | 6 36 3.85 | 2.4427 | 26 40 55.4 | 0.190 | 7 | 8 28 8.89 | 2.2067 | 24 4 15.3 | 6.355 |
| 8 | 6 38 30.31 | 2.4393 | 26 41 2.1 | + 0.033 | 8 | 8 30 21.12 | 2.2009 | 23 57 50.6 | 6.467 |
| 9 | 6 40 56.57 | 2.4359 | 26 40 59.4 | - 0.122 | 9 | 8 32 33.00 | 2.1951 | 23 51 19.2 | 6.578 |
| 10 | 6 43 22.62 | 2.4324 | 26 40 47.4 | 0.277 | 10 | 8 34 44.53 | 2.1892 | 23 44 41.2 | 6.687 |
| 11 | 6 45 48.46 | 2.4288 | 26 40 26.1 | 0.432 | 11 | 8 36 55.71 | 2.1833 | 23 37 56.7 | 6.796 |
| 12 | 6 48 14.08 | 2.4252 | 26 39 55.5 | 0.586 | 12 | 8 39 6.53 | 2.1774 | 23 31 5.7 | 6.903 |
| 13 | 6 50 39.48 | 2.4214 | 26 39 15.7 | 0.739 | 13 | 8 41 17.00 | 2.1716 | 23 24 8.3 | 7.010 |
| 14 | 6 53 4.65 | 2.4175 | 26 38 26.8 | 0.892 | 14 | 8 43 27.13 | 2.1658 | 23 17 4.5 | 7.116 |
| 15 | 6 55 29.58 | 2.4135 | 26 37 28.7 | 1.044 | 15 | 8 45 36.90 | 2.1599 | 23 9 54.4 | 7.221 |
| 16 | 6 57 54.27 | 2.4095 | 26 36 21.5 | 1.195 | 16 | 8 47 46.32 | 2.1541 | 23 2 38.0 | 7.324 |
| 17 | 7 0 18.72 | 2.4055 | 26 35 5.3 | 1.344 | 17 | 8 49 55.39 | 2.1482 | 22 55 15.5 | 7.426 |
| 18 | 7 2 42.93 | 2.4013 | 26 33 40.2 | 1.493 | 18 | 8 52 4.11 | 2.1424 | 22 47 46.9 | 7.527 |
| 19 | 7 5 6.88 | 2.3970 | 26 32 6.1 | 1.642 | 19 | 8 54 12.48 | 2.1366 | 22 40 12.3 | 7.627 |
| 20 | 7 7 30.57 | 2.3927 | 26 30 23.1 | 1.790 | 20 | 8 56 20.50 | 2.1308 | 22 32 31.6 | 7.727 |
| 21 | 7 9 54.00 | 2.3882 | 26 28 31.3 | 1.937 | 21 | 8 58 28.18 | 2.1251 | 22 24 45.0 | 7.826 |
| 22 | 7 12 17.16 | 2.3837 | 26 26 30.7 | 2.082 | 22 | 9 0 35.51 | 2.1193 | 22 16 52.5 | 7.923 |
| 23 | 7 14 40.05 | 2.3792 | 26 24 21.4 | 2.227 | 23 | 9 2 42.49 | 2.1135 | 22 8 54.3 | 8.018 |
| 24 | 7 17 2.66 | 2.3745 | N. 26 22 3.4 | 2.372 | 24 | 9 4 49.13 | 2.1077 | N. 22 0 50.4 | 8.113 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|------------|------------------|---------------------|-----------------|---------------------|---------------|------------------|---------------------|-----------------|---------------------|
| SUNDAY 25. | | | | | TUESDAY 27. | | | | |
| 0 | 9 4 49.13 | 2.1077 | N. 22° 0' 50.4" | 8.113 | 0 | 10 39 59.98 | 1.8750 | N. 14° 0' 25.1" | 11.556 |
| 1 | 9 6 55.42 | 2.1020 | 21 52 40.8 | 8.208 | 1 | 10 41 52.37 | 1.8713 | 13 48 50.2 | 11.606 |
| 2 | 9 9 1.37 | 2.0963 | 21 44 25.5 | 8.301 | 2 | 10 43 44.54 | 1.8677 | 13 37 12.4 | 11.655 |
| 3 | 9 11 6.98 | 2.0907 | 21 36 4.7 | 8.393 | 3 | 10 45 36.49 | 1.8641 | 13 25 31.6 | 11.704 |
| 4 | 9 13 12.25 | 2.0850 | 21 27 38.4 | 8.483 | 4 | 10 47 28.23 | 1.8606 | 13 13 47.9 | 11.752 |
| 5 | 9 15 17.18 | 2.0794 | 21 19 6.7 | 8.572 | 5 | 10 49 19.77 | 1.8572 | 13 2 1.3 | 11.800 |
| 6 | 9 17 21.78 | 2.0738 | 21 10 29.7 | 8.661 | 6 | 10 51 11.10 | 1.8538 | 12 50 11.9 | 11.846 |
| 7 | 9 19 26.04 | 2.0682 | 21 1 47.4 | 8.749 | 7 | 10 53 2.23 | 1.8506 | 12 38 19.8 | 11.892 |
| 8 | 9 21 29.97 | 2.0627 | 20 52 59.8 | 8.837 | 8 | 10 54 53.17 | 1.8474 | 12 26 24.9 | 11.937 |
| 9 | 9 23 33.56 | 2.0571 | 20 44 7.0 | 8.923 | 9 | 10 56 43.92 | 1.8443 | 12 14 27.3 | 11.982 |
| 10 | 9 25 36.82 | 2.0516 | 20 35 9.1 | 9.008 | 10 | 10 58 34.48 | 1.8412 | 12 2 27.1 | 12.025 |
| 11 | 9 27 39.76 | 2.0462 | 20 26 6.1 | 9.092 | 11 | 11 0 24.86 | 1.8381 | 11 50 24.3 | 12.068 |
| 12 | 9 29 42.37 | 2.0408 | 20 16 58.1 | 9.174 | 12 | 11 2 15.05 | 1.8351 | 11 38 18.9 | 12.111 |
| 13 | 9 31 44.66 | 2.0354 | 20 7 45.2 | 9.256 | 13 | 11 4 5.07 | 1.8322 | 11 26 11.0 | 12.152 |
| 14 | 9 33 46.62 | 2.0300 | 19 58 27.4 | 9.337 | 14 | 11 5 54.91 | 1.8293 | 11 14 0.7 | 12.192 |
| 15 | 9 35 48.26 | 2.0247 | 19 49 4.7 | 9.418 | 15 | 11 7 44.58 | 1.8264 | 11 1 48.0 | 12.232 |
| 16 | 9 37 49.58 | 2.0194 | 19 39 37.2 | 9.497 | 16 | 11 9 34.08 | 1.8237 | 10 49 32.9 | 12.271 |
| 17 | 9 39 50.59 | 2.0142 | 19 30 5.1 | 9.574 | 17 | 11 11 23.42 | 1.8210 | 10 37 15.5 | 12.309 |
| 18 | 9 41 51.29 | 2.0091 | 19 20 28.3 | 9.651 | 18 | 11 13 12.60 | 1.8183 | 10 24 55.8 | 12.347 |
| 19 | 9 43 51.68 | 2.0039 | 19 10 46.9 | 9.728 | 19 | 11 15 1.62 | 1.8157 | 10 12 33.8 | 12.384 |
| 20 | 9 45 51.76 | 1.9988 | 19 1 0.9 | 9.804 | 20 | 11 16 50.49 | 1.8133 | 10 0 9.7 | 12.420 |
| 21 | 9 47 51.53 | 1.9937 | 18 51 10.4 | 9.878 | 21 | 11 18 39.22 | 1.8109 | 9 47 43.4 | 12.456 |
| 22 | 9 49 51.00 | 1.9887 | 18 41 15.5 | 9.952 | 22 | 11 20 27.80 | 1.8085 | 9 35 15.0 | 12.490 |
| 23 | 9 51 50.17 | 1.9836 | N. 18 31 16.2 | 10.024 | 23 | 11 22 16.24 | 1.8063 | N. 9 22 44.6 | 12.524 |
| MONDAY 26. | | | | | WEDNESDAY 28. | | | | |
| 0 | 9 53 49.03 | 1.9786 | N. 18 21 12.6 | 10.096 | 0 | 11 24 4.55 | 1.8041 | N. 9 10 12.1 | 12.558 |
| 1 | 9 55 47.60 | 1.9737 | 18 11 4.7 | 10.167 | 1 | 11 25 52.73 | 1.8018 | 8 57 37.6 | 12.591 |
| 2 | 9 57 45.88 | 1.9689 | 18 0 52.6 | 10.236 | 2 | 11 27 40.77 | 1.7996 | 8 45 1.2 | 12.623 |
| 3 | 9 59 43.87 | 1.9641 | 17 50 36.4 | 10.305 | 3 | 11 29 28.68 | 1.7975 | 8 32 22.9 | 12.654 |
| 4 | 10 1 41.57 | 1.9594 | 17 40 16.0 | 10.374 | 4 | 11 31 16.47 | 1.7956 | 8 19 42.7 | 12.684 |
| 5 | 10 3 38.99 | 1.9547 | 17 29 51.5 | 10.441 | 5 | 11 33 4.15 | 1.7937 | 8 7 0.8 | 12.713 |
| 6 | 10 5 36.13 | 1.9500 | 17 19 23.1 | 10.507 | 6 | 11 34 51.71 | 1.7918 | 7 54 17.1 | 12.743 |
| 7 | 10 7 32.99 | 1.9453 | 17 8 50.7 | 10.572 | 7 | 11 36 39.16 | 1.7899 | 7 41 31.6 | 12.772 |
| 8 | 10 9 29.57 | 1.9407 | 16 58 14.4 | 10.637 | 8 | 11 38 26.50 | 1.7882 | 7 28 44.5 | 12.799 |
| 9 | 10 11 25.88 | 1.9362 | 16 47 34.3 | 10.700 | 9 | 11 40 13.74 | 1.7865 | 7 15 55.7 | 12.826 |
| 10 | 10 13 21.92 | 1.9318 | 16 36 50.4 | 10.763 | 10 | 11 42 0.88 | 1.7849 | 7 3 5.3 | 12.852 |
| 11 | 10 15 17.70 | 1.9274 | 16 26 2.7 | 10.826 | 11 | 11 43 47.93 | 1.7833 | 6 50 13.4 | 12.878 |
| 12 | 10 17 13.21 | 1.9230 | 16 15 11.3 | 10.887 | 12 | 11 45 34.88 | 1.7817 | 6 37 19.9 | 12.904 |
| 13 | 10 19 8.46 | 1.9187 | 16 4 16.3 | 10.947 | 13 | 11 47 21.74 | 1.7804 | 6 24 24.9 | 12.928 |
| 14 | 10 21 3.46 | 1.9145 | 15 53 17.7 | 11.006 | 14 | 11 49 8.52 | 1.7791 | 6 11 28.5 | 12.951 |
| 15 | 10 22 58.20 | 1.9103 | 15 42 15.6 | 11.064 | 15 | 11 50 55.23 | 1.7778 | 5 58 30.8 | 12.974 |
| 16 | 10 24 52.69 | 1.9061 | 15 31 10.0 | 11.122 | 16 | 11 52 41.86 | 1.7765 | 5 45 31.7 | 12.996 |
| 17 | 10 26 46.93 | 1.9020 | 15 20 0.9 | 11.180 | 17 | 11 54 28.41 | 1.7753 | 5 32 31.3 | 13.017 |
| 18 | 10 28 40.93 | 1.8980 | 15 8 48.4 | 11.237 | 18 | 11 56 14.89 | 1.7741 | 5 19 29.6 | 13.038 |
| 19 | 10 30 34.69 | 1.8940 | 14 57 32.5 | 11.292 | 19 | 11 58 1.30 | 1.7731 | 5 6 26.7 | 13.058 |
| 20 | 10 32 28.21 | 1.8900 | 14 46 13.4 | 11.345 | 20 | 11 59 47.66 | 1.7722 | 4 53 22.6 | 13.078 |
| 21 | 10 34 21.49 | 1.8861 | 14 34 51.1 | 11.398 | 21 | 12 1 33.96 | 1.7712 | 4 40 17.3 | 13.097 |
| 22 | 10 36 14.54 | 1.8823 | 14 23 25.6 | 11.451 | 22 | 12 3 20.20 | 1.7704 | 4 27 10.9 | 13.115 |
| 23 | 10 38 7.37 | 1.8786 | 14 11 56.9 | 11.504 | 23 | 12 5 6.40 | 1.7696 | 4 14 3.5 | 13.132 |
| 24 | 10 39 59.98 | 1.8750 | N. 14 0 25.1 | 11.556 | 24 | 12 6 52.55 | 1.7688 | N. 4 0 55.1 | 13.148 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|--------------|---------------------|---------------------|------------------|---------------------|---------------|---------------------|
| THURSDAY 29. | | | | | SATURDAY 31. | | | | |
| 0 | 12 6 52.55 | 1.7688 | N. 4 0 55.1 | 13.148 | 0 | 13 32 8.34 | 1.8080 | S. 6 35' 58.4 | 13.107 |
| 1 | 12 8 38.65 | 1.7681 | 3 47 45.7 | 13.164 | 1 | 13 33 56.89 | 1.8104 | 6 49 4.3 | 13.087 |
| 2 | 12 10 24.72 | 1.7676 | 3 34 35.4 | 13.180 | 2 | 13 35 45.59 | 1.8128 | 7 2 8.9 | 13.067 |
| 3 | 12 12 10.76 | 1.7671 | 3 21 24.1 | 13.195 | 3 | 13 37 34.43 | 1.8152 | 7 15 12.3 | 13.046 |
| 4 | 12 13 56.77 | 1.7666 | 3 8 12.0 | 13.209 | 4 | 13 39 23.42 | 1.8177 | 7 28 14.4 | 13.024 |
| 5 | 12 15 42.75 | 1.7661 | 2 54 59.1 | 13.222 | 5 | 13 41 12.56 | 1.8203 | 7 41 15.2 | 13.002 |
| 6 | 12 17 28.70 | 1.7657 | 2 41 45.4 | 13.234 | 6 | 13 43 1.86 | 1.8230 | 7 54 14.6 | 12.978 |
| 7 | 12 19 14.63 | 1.7654 | 2 28 31.0 | 13.246 | 7 | 13 44 51.32 | 1.8257 | 8 7 12.6 | 12.954 |
| 8 | 12 21 0.55 | 1.7652 | 2 15 15.9 | 13.257 | 8 | 13 46 40.95 | 1.8285 | 8 20 9.1 | 12.928 |
| 9 | 12 22 46.46 | 1.7651 | 2 2 0.2 | 13.267 | 9 | 13 48 30.74 | 1.8313 | 8 33 4.0 | 12.902 |
| 10 | 12 24 32.36 | 1.7650 | 1 48 43.8 | 13.277 | 10 | 13 50 20.70 | 1.8342 | 8 45 57.3 | 12.875 |
| 11 | 12 26 18.26 | 1.7649 | 1 35 26.9 | 13.286 | 11 | 13 52 10.84 | 1.8372 | 8 58 49.0 | 12.847 |
| 12 | 12 28 4.15 | 1.7649 | 1 22 9.5 | 13.294 | 12 | 13 54 1.16 | 1.8402 | 9 11 39.0 | 12.818 |
| 13 | 12 29 50.05 | 1.7651 | 1 8 51.6 | 13.302 | 13 | 13 55 51.66 | 1.8432 | 9 24 27.2 | 12.789 |
| 14 | 12 31 35.96 | 1.7652 | 0 55 33.3 | 13.309 | 14 | 13 57 42.35 | 1.8463 | 9 37 13.7 | 12.759 |
| 15 | 12 33 21.88 | 1.7654 | 0 42 14.5 | 13.316 | 15 | 13 59 33.22 | 1.8494 | 9 49 58.3 | 12.727 |
| 16 | 12 35 7.81 | 1.7657 | 0 28 55.4 | 13.321 | 16 | 14 1 24.28 | 1.8527 | 10 2 41.0 | 12.695 |
| 17 | 12 36 53.76 | 1.7661 | 0 15 36.0 | 13.325 | 17 | 14 3 15.54 | 1.8560 | 10 15 21.7 | 12.662 |
| 18 | 12 38 39.74 | 1.7666 | N. 0 2 16.4 | 13.329 | 18 | 14 5 7.00 | 1.8593 | 10 28 0.4 | 12.627 |
| 19 | 12 40 25.75 | 1.7670 | S. 0 11 3.5 | 13.332 | 19 | 14 6 58.66 | 1.8627 | 10 40 37.0 | 12.592 |
| 20 | 12 42 11.78 | 1.7674 | 0 24 23.5 | 13.335 | 20 | 14 8 50.53 | 1.8662 | 10 53 11.5 | 12.557 |
| 21 | 12 43 57.84 | 1.7680 | 0 37 43.7 | 13.337 | 21 | 14 10 42.61 | 1.8697 | 11 5 43.9 | 12.521 |
| 22 | 12 45 43.94 | 1.7687 | 0 51 4.0 | 13.338 | 22 | 14 12 34.90 | 1.8733 | 11 18 14.0 | 12.483 |
| 23 | 12 47 30.09 | 1.7695 | S. 1 4 24.3 | 13.338 | 23 | 14 14 27.41 | 1.8769 | S. 11 30 41.8 | 12.444 |
| FRIDAY 30. | | | | | SUNDAY, NOVEMBER 1. | | | | |
| 0 | 12 49 16.28 | 1.7703 | S. 1 17 44.6 | 13.338 | 0 | 14 16 20.13 | 1.8806 | S. 11 43 7.3 | 12.405 |
| 1 | 12 51 2.52 | 1.7713 | 1 31 4.9 | 13.337 | | | | | |
| 2 | 12 52 48.82 | 1.7721 | 1 44 25.1 | 13.336 | | | | | |
| 3 | 12 54 35.17 | 1.7730 | 1 57 45.2 | 13.333 | | | | | |
| 4 | 12 56 21.58 | 1.7741 | 2 11 5.1 | 13.330 | | | | | |
| 5 | 12 58 8.06 | 1.7752 | 2 24 24.8 | 13.326 | | | | | |
| 6 | 12 59 54.60 | 1.7763 | 2 37 44.2 | 13.321 | | | | | |
| 7 | 13 1 41.21 | 1.7775 | 2 51 3.3 | 13.316 | | | | | |
| 8 | 13 3 27.90 | 1.7789 | 3 4 22.1 | 13.311 | | | | | |
| 9 | 13 5 14.68 | 1.7803 | 3 17 40.6 | 13.304 | | | | | |
| 10 | 13 7 1.54 | 1.7817 | 3 30 58.6 | 13.296 | | | | | |
| 11 | 13 8 48.48 | 1.7831 | 3 44 16.1 | 13.287 | | | | | |
| 12 | 13 10 35.51 | 1.7847 | 3 57 33.0 | 13.278 | | | | | |
| 13 | 13 12 22.64 | 1.7863 | 4 10 49.4 | 13.268 | | | | | |
| 14 | 13 14 9.87 | 1.7879 | 4 24 5.2 | 13.257 | | | | | |
| 15 | 13 15 57.19 | 1.7896 | 4 37 20.3 | 13.246 | | | | | |
| 16 | 13 17 44.62 | 1.7914 | 4 50 34.7 | 13.233 | | | | | |
| 17 | 13 19 32.16 | 1.7933 | 5 3 48.3 | 13.220 | | | | | |
| 18 | 13 21 19.82 | 1.7952 | 5 17 1.1 | 13.207 | | | | | |
| 19 | 13 23 7.50 | 1.7972 | 5 30 13.1 | 13.192 | | | | | |
| 20 | 13 24 55.48 | 1.7992 | 5 43 24.1 | 13.176 | | | | | |
| 21 | 13 26 43.50 | 1.8014 | 5 56 34.2 | 13.160 | | | | | |
| 22 | 13 28 31.65 | 1.8036 | 6 9 43.3 | 13.143 | | | | | |
| 23 | 13 30 19.93 | 1.8058 | 6 22 51.4 | 13.126 | | | | | |
| 24 | 13 32 8.34 | 1.8080 | S. 6 35 58.4 | 13.107 | | | | | |

| PHASES OF THE MOON. | | | | |
|---------------------|------------|----|----|------|
| ● New Moon | . . . Oct. | d | h | m |
| ☾ First Quarter | | 10 | 10 | 56.7 |
| ○ Full Moon | | 17 | 1 | 45.0 |
| ☾ Last Quarter | | 24 | 1 | 56.1 |

| | | | |
|-----------|----------------|----|------|
| ☾ Apogee | Oct. | d | h |
| ☾ Perigee | | 16 | 5.4 |
| ☾ Apogee | | 28 | 16.7 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the month. | Name and Direction of Object. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|----|------------|----------------|-------------|----------------|-------------|----------------|-----------|----------------|
| 4 | SUN | W. | 16° 6' 48" | 3516 | 17° 26' 54" | 3497 | 18° 47' 22" | 3480 | 20° 8' 9" | 3463 |
| | Antares | E. | 41 56 34 | 3047 | 40 27 19 | 3043 | 38 58 0 | 3040 | 37 28 37 | 3038 |
| | α Aquilæ | E. | 91 40 17 | 3835 | 90 25 51 | 3831 | 89 11 21 | 3827 | 87 56 47 | 3825 |
| | Fomalhaut | E. | 123 50 0 | 3976 | 122 25 21 | 3985 | 121 0 28 | 3953 | 119 35 21 | 3941 |
| 5 | SUN | W. | 26 55 57 | 3405 | 28 18 8 | 3394 | 29 40 31 | 3386 | 31 3 4 | 3376 |
| | Antares | E. | 30 0 53 | 3024 | 28 31 10 | 3022 | 27 1 25 | 3022 | 25 31 39 | 3020 |
| | α Aquilæ | E. | 81 43 31 | 3892 | 80 28 52 | 3825 | 79 14 16 | 3827 | 77 59 42 | 3831 |
| | Fomalhaut | E. | 112 26 34 | 3190 | 111 0 13 | 3180 | 109 33 40 | 3171 | 108 6 56 | 3162 |
| 6 | SUN | W. | 37 58 28 | 3331 | 39 22 4 | 3321 | 40 45 51 | 3313 | 42 9 48 | 3302 |
| | α Aquilæ | E. | 71 48 12 | 3866 | 70 34 18 | 3877 | 69 20 35 | 3889 | 68 7 4 | 3902 |
| | Fomalhaut | E. | 100 50 33 | 3117 | 99 22 44 | 3109 | 97 54 45 | 3100 | 96 26 35 | 3091 |
| | JUPITER | E. | 108 31 45 | 2918 | 106 59 49 | 2911 | 105 27 44 | 2903 | 103 55 29 | 2896 |
| 7 | SUN | W. | 49 12 27 | 3253 | 50 37 34 | 3242 | 52 2 54 | 3231 | 53 28 26 | 3220 |
| | α Aquilæ | E. | 62 3 27 | 3997 | 60 51 44 | 4023 | 59 40 27 | 4051 | 58 29 38 | 4083 |
| | Fomalhaut | E. | 89 3 4 | 3047 | 87 33 50 | 3039 | 86 4 25 | 3030 | 84 34 49 | 3021 |
| | JUPITER | E. | 96 11 45 | 2855 | 94 38 28 | 2845 | 93 4 59 | 2837 | 91 31 19 | 2827 |
| | α Pegasi | E. | 107 56 10 | 3313 | 106 32 14 | 3297 | 105 7 59 | 3282 | 103 43 26 | 3267 |
| 8 | SUN | W. | 60 39 29 | 3162 | 62 6 24 | 3148 | 63 33 35 | 3136 | 65 1 1 | 3123 |
| | α Aquilæ | E. | 52 44 14 | 4296 | 51 37 18 | 4333 | 50 31 14 | 4417 | 49 26 8 | 4488 |
| | Fomalhaut | E. | 77 4 6 | 2977 | 75 33 25 | 2969 | 74 2 33 | 2960 | 72 31 30 | 2951 |
| | JUPITER | E. | 83 39 45 | 2776 | 82 4 46 | 2765 | 80 29 32 | 2753 | 78 54 3 | 2742 |
| | α Pegasi | E. | 96 36 23 | 3196 | 95 10 9 | 3183 | 93 43 39 | 3170 | 92 16 54 | 3158 |
| 9 | SUN | W. | 72 22 16 | 3054 | 73 51 22 | 3039 | 75 20 47 | 3024 | 76 50 30 | 3009 |
| | Antares | W. | 20 3 23 | 2785 | 21 38 37 | 2742 | 23 14 21 | 2722 | 24 50 32 | 2701 |
| | Fomalhaut | E. | 64 53 37 | 2912 | 63 21 33 | 2904 | 61 49 19 | 2898 | 60 16 57 | 2891 |
| | JUPITER | E. | 70 52 46 | 2681 | 69 15 41 | 2669 | 67 38 19 | 2655 | 66 0 39 | 2641 |
| | α Pegasi | E. | 84 59 27 | 3099 | 83 31 16 | 3087 | 82 2 51 | 3078 | 80 34 14 | 3068 |
| | α Arietis | E. | 127 45 58 | 2845 | 126 12 28 | 2826 | 124 38 34 | 2807 | 123 4 15 | 2788 |
| 10 | SUN | W. | 84 23 52 | 2930 | 85 55 33 | 2914 | 87 27 34 | 2897 | 88 59 57 | 2880 |
| | Antares | W. | 32 57 46 | 2612 | 34 36 25 | 2595 | 36 15 27 | 2577 | 37 54 53 | 2561 |
| | Fomalhaut | E. | 52 33 19 | 2869 | 51 0 21 | 2867 | 49 27 20 | 2867 | 47 54 19 | 2869 |
| | JUPITER | E. | 57 47 41 | 2572 | 56 8 8 | 2559 | 54 28 16 | 2543 | 52 48 3 | 2529 |
| | α Pegasi | E. | 73 8 17 | 3026 | 71 38 36 | 3018 | 70 8 46 | 3013 | 68 38 49 | 3009 |
| | α Arietis | E. | 115 6 34 | 2696 | 113 29 49 | 2679 | 111 52 41 | 2661 | 110 15 9 | 2643 |
| 11 | SUN | W. | 96 47 16 | 2795 | 98 21 51 | 2777 | 99 56 49 | 2760 | 101 32 10 | 2742 |
| | Antares | W. | 46 17 55 | 2475 | 47 59 43 | 2458 | 49 41 55 | 2441 | 51 24 31 | 2425 |
| | JUPITER | E. | 44 21 51 | 2455 | 42 39 34 | 2441 | 40 56 57 | 2426 | 39 13 58 | 2412 |
| | α Pegasi | E. | 61 8 3 | 3001 | 59 37 52 | 3004 | 58 7 44 | 3009 | 56 37 43 | 3016 |
| | α Arietis | E. | 102 1 30 | 2556 | 100 21 35 | 2539 | 98 41 16 | 2522 | 97 0 33 | 2501 |
| 12 | SUN | W. | 109 34 44 | 2655 | 111 12 25 | 2637 | 112 50 30 | 2620 | 114 28 58 | 2603 |
| | Antares | W. | 60 3 30 | 2341 | 61 48 30 | 2324 | 63 33 55 | 2307 | 65 19 44 | 2291 |
| | JUPITER | E. | 30 34 4 | 2343 | 28 49 7 | 2331 | 27 3 53 | 2322 | 25 18 25 | 2313 |
| | α Pegasi | E. | 49 10 56 | 3097 | 47 42 43 | 3124 | 46 15 3 | 3158 | 44 48 4 | 3198 |
| | α Arietis | E. | 88 31 4 | 2432 | 86 48 0 | 2406 | 85 4 34 | 2391 | 83 20 46 | 2375 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|-------------|----------------|------------|----------------|-------------|----------------|
| 4 | SUN W. | 21° 29' 14" | 3450 | 22° 50' 34" | 3437 | 24° 12' 9" | 3485 | 25° 33' 57" | 3415 |
| | Antares E. | 35 59 11 | 3035 | 34 29 42 | 3039 | 33 0 9 | 3030 | 31 30 33 | 3086 |
| | α Aquilæ E. | 86 42 11 | 3899 | 85 27 32 | 3891 | 84 12 52 | 3890 | 82 58 11 | 3891 |
| | Fomalhaut E. | 118 10 0 | 3931 | 116 44 27 | 3920 | 115 18 41 | 3909 | 113 52 43 | 3900 |
| 5 | SUN W. | 32 25 48 | 3387 | 33 48 42 | 3358 | 35 11 47 | 3349 | 36 35 2 | 3339 |
| | Antares E. | 24 1 51 | 3020 | 22 32 3 | 3029 | 21 2 17 | 3023 | 19 32 33 | 3026 |
| | α Aquilæ E. | 76 45 12 | 3836 | 75 30 47 | 3849 | 74 16 28 | 3849 | 73 2 16 | 3856 |
| | Fomalhaut E. | 106 40 1 | 3153 | 105 12 55 | 3143 | 103 45 38 | 3135 | 102 18 11 | 3156 |
| 6 | SUN W. | 43 33 57 | 3993 | 44 58 17 | 3989 | 46 22 49 | 3973 | 47 47 32 | 3963 |
| | α Aquilæ E. | 66 53 46 | 3918 | 65 40 44 | 3934 | 64 27 59 | 3953 | 63 15 33 | 3973 |
| | Fomalhaut E. | 94 58 14 | 3089 | 93 29 42 | 3073 | 92 1 0 | 3065 | 90 32 7 | 3056 |
| | JUPITER E. | 102 23 5 | 2888 | 100 50 31 | 2880 | 99 17 46 | 2872 | 97 44 51 | 2863 |
| 7 | SUN W. | 54 54 11 | 3909 | 56 20 10 | 3198 | 57 46 22 | 3186 | 59 12 48 | 3173 |
| | α Aquilæ E. | 57 19 20 | 4117 | 56 9 35 | 4158 | 55 0 27 | 4198 | 53 51 59 | 4244 |
| | Fomalhaut E. | 83 5 2 | 3019 | 81 35 4 | 3004 | 80 4 56 | 2994 | 78 34 36 | 2986 |
| | JUPITER E. | 89 57 26 | 2818 | 88 23 21 | 2807 | 86 49 2 | 2797 | 85 14 30 | 2787 |
| | α Pegasi E. | 102 18 36 | 3259 | 100 53 28 | 3237 | 99 28 3 | 3223 | 98 2 21 | 3209 |
| 8 | SUN W. | 66 28 43 | 3110 | 67 56 41 | 3098 | 69 24 56 | 3082 | 70 53 27 | 3068 |
| | α Aquilæ E. | 48 22 5 | 4565 | 47 19 10 | 4651 | 46 17 29 | 4747 | 45 17 9 | 4855 |
| | Fomalhaut E. | 71 0 16 | 2943 | 69 28 52 | 2935 | 67 57 17 | 2927 | 66 25 32 | 2919 |
| | JUPITER E. | 77 18 19 | 2731 | 75 42 20 | 2719 | 74 6 5 | 2707 | 72 29 34 | 2694 |
| | α Pegasi E. | 90 49 54 | 3145 | 89 22 39 | 3133 | 87 55 9 | 3121 | 86 27 25 | 3110 |
| 9 | SUN W. | 78 20 31 | 2993 | 79 50 52 | 2978 | 81 21 32 | 2962 | 82 52 32 | 2946 |
| | Antares W. | 26 27 10 | 2683 | 28 4 13 | 2665 | 29 41 40 | 2647 | 31 19 31 | 2629 |
| | Fomalhaut E. | 58 44 27 | 2885 | 57 11 49 | 2880 | 55 39 5 | 2875 | 54 6 14 | 2872 |
| | JUPITER E. | 64 22 40 | 2628 | 62 44 23 | 2615 | 61 5 48 | 2601 | 59 26 54 | 2587 |
| | α Pegasi E. | 79 5 25 | 3058 | 77 36 24 | 3049 | 76 7 12 | 3040 | 74 37 49 | 3033 |
| | α Arietis E. | 121 29 31 | 2769 | 119 54 23 | 2751 | 118 18 51 | 2733 | 116 42 55 | 2714 |
| 10 | SUN W. | 90 32 41 | 2663 | 92 5 47 | 2647 | 93 39 14 | 2629 | 95 13 4 | 2612 |
| | Antares W. | 39 34 42 | 2543 | 41 14 55 | 2527 | 42 55 31 | 2510 | 44 36 31 | 2492 |
| | Fomalhaut E. | 46 21 21 | 2873 | 44 48 27 | 2878 | 43 15 40 | 2887 | 41 43 4 | 2897 |
| | JUPITER E. | 51 7 30 | 2514 | 49 26 36 | 2499 | 47 45 22 | 2485 | 46 3 47 | 2470 |
| | α Pegasi E. | 67 8 47 | 3005 | 65 38 40 | 3001 | 64 8 29 | 3000 | 62 38 16 | 3000 |
| | α Arietis E. | 108 37 13 | 2696 | 106 58 53 | 2698 | 105 20 9 | 2691 | 103 41 1 | 2574 |
| 11 | SUN W. | 103 7 54 | 2725 | 104 44 1 | 2707 | 106 20 32 | 2689 | 107 57 26 | 2672 |
| | Antares W. | 53 7 30 | 2408 | 54 50 54 | 2391 | 56 34 42 | 2374 | 58 18 54 | 2357 |
| | JUPITER E. | 37 30 40 | 2397 | 35 47 1 | 2383 | 34 3 2 | 2369 | 32 18 43 | 2355 |
| | α Pegasi E. | 55 7 50 | 3096 | 53 38 9 | 3039 | 52 8 44 | 3054 | 50 39 38 | 3073 |
| | α Arietis E. | 95 19 26 | 2488 | 93 37 56 | 2471 | 91 56 2 | 2455 | 90 13 45 | 2438 |
| 12 | SUN W. | 116 7 49 | 2586 | 117 47 3 | 2569 | 119 26 40 | 2553 | 121 6 40 | 2537 |
| | Antares W. | 67 5 56 | 2275 | 68 52 32 | 2260 | 70 39 31 | 2243 | 72 26 54 | 2229 |
| | JUPITER E. | 23 32 44 | 2306 | 21 46 53 | 2300 | 20 0 54 | 2297 | 18 14 50 | 2296 |
| | α Pegasi E. | 43 21 52 | 3245 | 41 56 36 | 3300 | 40 32 24 | 3365 | 39 9 27 | 3443 |
| | α Arietis E. | 81 36 36 | 2361 | 79 52 5 | 2346 | 78 7 12 | 2339 | 76 21 59 | 2317 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|--------------|----------------|-------------|----------------|--------------|----------------|--------------|----------------|
| 12 | Aldebaran E. | 118° 56' 26" | 2365 | 117° 12' 1" | 2348 | 115° 27' 12" | 2331 | 113° 41' 58" | 2315 |
| 13 | Sun W. | 122 47 2 | 2501 | 124 27 46 | 2506 | 126 8 51 | 2490 | 127 50 18 | 2476 |
| | Antares W. | 74 14 39 | 2213 | 76 2 47 | 2198 | 77 51 17 | 2184 | 79 40 9 | 2170 |
| | α Arietis E. | 74 36 25 | 2304 | 72 50 32 | 2292 | 71 4 21 | 2280 | 69 17 52 | 2268 |
| | Aldebaran E. | 104 49 47 | 2234 | 103 2 10 | 2219 | 101 14 11 | 2204 | 99 25 50 | 2190 |
| 14 | Antares W. | 88 49 38 | 2105 | 90 40 30 | 2094 | 92 31 39 | 2083 | 94 23 5 | 2072 |
| | α Aquilæ W. | 49 36 0 | 3723 | 50 52 23 | 3697 | 52 10 28 | 3539 | 53 30 9 | 3458 |
| | α Arietis E. | 60 21 29 | 2221 | 58 33 33 | 2215 | 56 45 28 | 2210 | 54 57 15 | 2206 |
| | Aldebaran E. | 90 18 52 | 2124 | 88 28 30 | 2113 | 86 37 51 | 2102 | 84 46 55 | 2092 |
| 15 | Antares W. | 103 44 3 | 2028 | 105 36 53 | 2022 | 107 29 53 | 2016 | 109 23 3 | 2010 |
| | α Aquilæ W. | 60 28 57 | 3149 | 61 56 7 | 3104 | 63 24 12 | 3061 | 64 53 9 | 3024 |
| | Fomalhaut W. | 25 31 55 | 3080 | 27 0 29 | 2944 | 28 31 52 | 2831 | 30 5 40 | 2735 |
| | α Arietis E. | 45 55 19 | 2207 | 44 7 2 | 2214 | 42 18 55 | 2223 | 40 31 1 | 2225 |
| | Aldebaran E. | 75 28 38 | 2050 | 73 36 21 | 2044 | 71 43 55 | 2039 | 69 51 21 | 2033 |
| | Pollux E. | 119 33 48 | 2025 | 117 40 52 | 2018 | 115 47 46 | 2012 | 113 54 30 | 2006 |
| 16 | α Aquilæ W. | 72 28 9 | 2287 | 74 0 45 | 2269 | 75 33 44 | 2254 | 77 7 2 | 2241 |
| | Fomalhaut W. | 38 20 31 | 2441 | 40 3 8 | 2405 | 41 46 36 | 2374 | 43 30 48 | 2348 |
| | JUPITER W. | 29 0 20 | 2003 | 30 53 49 | 1998 | 32 47 26 | 1995 | 34 41 8 | 1993 |
| | Aldebaran E. | 60 27 3 | 2023 | 58 34 4 | 2023 | 56 41 5 | 2025 | 54 48 9 | 2027 |
| | Pollux E. | 104 26 19 | 1989 | 102 32 27 | 1988 | 100 38 34 | 1987 | 98 44 40 | 1987 |
| 17 | α Aquilæ W. | 84 56 35 | 2215 | 86 30 43 | 2217 | 88 4 49 | 2221 | 89 38 50 | 2222 |
| | Fomalhaut W. | 52 19 27 | 2270 | 54 6 11 | 2262 | 55 53 6 | 2257 | 57 40 9 | 2253 |
| | JUPITER W. | 44 9 50 | 2000 | 46 3 25 | 2003 | 47 56 54 | 2009 | 49 50 15 | 2015 |
| | α Pegasi W. | 37 36 41 | 2231 | 39 2 13 | 2139 | 40 29 35 | 2080 | 41 58 34 | 2091 |
| | Aldebaran E. | 45 25 0 | 2056 | 43 32 53 | 2066 | 41 41 1 | 2076 | 39 49 25 | 2082 |
| | Pollux E. | 89 15 43 | 2001 | 87 22 11 | 2007 | 85 28 48 | 2013 | 83 35 34 | 2019 |
| 18 | α Aquilæ W. | 97 25 53 | 2292 | 98 58 22 | 2212 | 100 30 26 | 2234 | 102 2 2 | 2258 |
| | Fomalhaut W. | 66 35 51 | 2260 | 68 22 49 | 2266 | 70 9 38 | 2273 | 71 56 17 | 2281 |
| | JUPITER W. | 59 14 16 | 2056 | 61 6 23 | 2066 | 62 58 14 | 2077 | 64 49 48 | 2090 |
| | α Pegasi W. | 49 41 15 | 2273 | 51 16 18 | 2247 | 52 51 55 | 2237 | 54 27 59 | 2210 |
| | Pollux E. | 74 12 22 | 2063 | 72 20 26 | 2075 | 70 28 48 | 2086 | 68 37 28 | 2098 |
| | Regulus E. | 110 29 21 | 2076 | 108 37 45 | 2087 | 106 46 26 | 2098 | 104 55 24 | 2110 |
| 19 | Fomalhaut W. | 80 46 3 | 2237 | 82 31 9 | 2250 | 84 15 55 | 2265 | 86 0 20 | 2281 |
| | JUPITER W. | 74 2 46 | 2157 | 75 52 18 | 2173 | 77 41 26 | 2188 | 79 30 11 | 2205 |
| | α Pegasi W. | 62 32 35 | 2272 | 64 9 53 | 2271 | 65 47 12 | 2273 | 67 24 28 | 2277 |
| | Pollux E. | 59 25 44 | 2168 | 57 36 28 | 2184 | 55 47 36 | 2200 | 53 59 8 | 2216 |
| | Regulus E. | 95 45 3 | 2178 | 93 56 2 | 2194 | 92 7 25 | 2209 | 90 19 11 | 2225 |
| 20 | Fomalhaut W. | 94 36 31 | 2468 | 96 18 29 | 2487 | 98 0 0 | 2507 | 99 41 3 | 2527 |
| | JUPITER W. | 88 27 42 | 2291 | 90 13 54 | 2309 | 91 59 40 | 2328 | 93 44 59 | 2346 |
| | α Pegasi W. | 75 28 48 | 2219 | 77 5 3 | 2231 | 78 41 2 | 2244 | 80 16 43 | 2259 |
| | α Arietis W. | 31 52 54 | 2226 | 33 31 13 | 2217 | 35 9 45 | 2211 | 36 48 25 | 2208 |
| | Pollux E. | 45 3 6 | 2204 | 43 17 12 | 2223 | 41 31 46 | 2242 | 39 46 48 | 2261 |
| | Regulus E. | 81 24 11 | 2212 | 79 38 29 | 2231 | 77 53 14 | 2249 | 76 3 26 | 2267 |
| | Sun E. | 139 53 43 | 2224 | 138 15 21 | 2243 | 136 37 25 | 2262 | 134 59 53 | 2281 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|--------------|----------------|--------------|----------------|--------------|----------------|-------------|----------------|
| 12 | Aldebaran E. | 111° 56' 20" | 2226 | 110° 10' 17" | 2222 | 108° 23' 51" | 2226 | 106° 37' 1" | 2249 |
| 13 | Sun W. | 129 32 5 | 2461 | 131 14 13 | 2448 | 132 56 40 | 2434 | 134 39 26 | 2422 |
| | Antares W. | 81 29 22 | 2156 | 83 18 56 | 2142 | 85 8 51 | 2130 | 86 59 5 | 2117 |
| | α Arietis E. | 67 31 5 | 2258 | 65 44 3 | 2247 | 63 56 45 | 2237 | 62 9 13 | 2229 |
| | Aldebaran E. | 97 37 7 | 2176 | 95 48 3 | 2163 | 93 58 39 | 2149 | 92 8 55 | 2137 |
| 14 | Antares W. | 96 14 48 | 2022 | 98 6 46 | 2052 | 99 58 59 | 2044 | 101 51 25 | 2036 |
| | α Aquilæ W. | 54 51 20 | 2325 | 56 13 54 | 2318 | 57 37 45 | 2356 | 59 2 48 | 2300 |
| | α Arietis E. | 53 8 56 | 2203 | 51 20 33 | 2201 | 49 32 7 | 2202 | 47 43 42 | 2203 |
| | Aldebaran E. | 82 55 44 | 2023 | 81 4 18 | 2073 | 79 12 37 | 2064 | 77 20 43 | 2057 |
| 15 | Antares W. | 111 16 21 | 2008 | 113 9 46 | 2002 | 115 3 17 | 1999 | 116 56 53 | 1997 |
| | α Aquilæ W. | 66 22 52 | 2269 | 67 53 18 | 2259 | 69 24 22 | 2232 | 70 56 0 | 2208 |
| | Fomalhaut W. | 31 41 33 | 2258 | 33 19 12 | 2238 | 34 58 23 | 2231 | 36 38 53 | 2422 |
| | α Arietis E. | 38 43 25 | 2250 | 36 56 12 | 2269 | 35 9 27 | 2233 | 33 23 17 | 2222 |
| | Aldebaran E. | 67 58 39 | 2030 | 66 5 51 | 2026 | 64 12 58 | 2025 | 62 20 2 | 2022 |
| | Pollux E. | 112 1 5 | 2001 | 110 7 32 | 1997 | 108 13 53 | 1993 | 106 20 8 | 1991 |
| 16 | α Aquilæ W. | 78 40 37 | 2231 | 80 14 25 | 2223 | 81 48 23 | 2218 | 83 22 27 | 2215 |
| | Fomalhaut W. | 45 15 38 | 2226 | 47 1 0 | 2208 | 48 46 48 | 2223 | 50 32 58 | 2220 |
| | Jupiter W. | 36 34 53 | 1993 | 38 28 39 | 1993 | 40 22 25 | 1994 | 42 16 9 | 1996 |
| | Aldebaran E. | 52 55 17 | 2030 | 51 2 30 | 2035 | 49 9 51 | 2041 | 47 17 20 | 2048 |
| | Pollux E. | 96 50 46 | 1989 | 94 56 54 | 1991 | 93 3 6 | 1994 | 91 9 22 | 1997 |
| 17 | α Aquilæ W. | 91 12 42 | 2236 | 92 46 23 | 2246 | 94 19 51 | 2259 | 95 53 2 | 2275 |
| | Fomalhaut W. | 59 27 17 | 2252 | 61 14 27 | 2251 | 63 1 38 | 2253 | 64 48 47 | 2256 |
| | Jupiter W. | 51 43 26 | 2021 | 53 36 27 | 2022 | 55 29 17 | 2037 | 57 21 54 | 2046 |
| | α Pegasi W. | 43 28 58 | 2233 | 45 0 35 | 2223 | 46 33 16 | 2240 | 48 6 52 | 2204 |
| | Aldebaran E. | 37 58 7 | 2101 | 36 7 10 | 2116 | 34 16 36 | 2134 | 32 26 29 | 2155 |
| | Pollux E. | 81 42 30 | 2027 | 79 49 38 | 2035 | 77 56 59 | 2044 | 76 4 33 | 2053 |
| 18 | α Aquilæ W. | 103 33 8 | 2224 | 105 3 41 | 2213 | 106 33 36 | 2244 | 108 2 56 | 2278 |
| | Fomalhaut W. | 73 42 44 | 2221 | 75 28 57 | 2200 | 77 14 56 | 2212 | 79 0 38 | 2224 |
| | Jupiter W. | 66 41 3 | 2102 | 68 31 59 | 2115 | 70 22 36 | 2122 | 72 12 52 | 2143 |
| | α Pegasi W. | 56 4 26 | 2225 | 57 41 12 | 2236 | 59 18 11 | 2272 | 60 55 20 | 2274 |
| | Pollux E. | 66 46 26 | 2111 | 64 55 44 | 2125 | 63 5 23 | 2139 | 61 15 23 | 2153 |
| | Regulus E. | 103 4 40 | 2122 | 101 14 15 | 2136 | 99 24 10 | 2149 | 97 34 26 | 2163 |
| 19 | Fomalhaut W. | 87 44 22 | 2227 | 89 28 1 | 2214 | 91 11 16 | 2231 | 92 54 6 | 2242 |
| | Jupiter W. | 81 18 31 | 2221 | 83 6 27 | 2222 | 84 53 58 | 2256 | 86 41 3 | 2273 |
| | α Pegasi W. | 69 1 39 | 2223 | 70 38 42 | 2220 | 72 15 36 | 2222 | 73 52 18 | 2207 |
| | Pollux E. | 52 11 4 | 2233 | 50 23 26 | 2250 | 48 36 13 | 2268 | 46 49 26 | 2286 |
| | Regulus E. | 88 31 20 | 2241 | 86 43 54 | 2259 | 84 56 54 | 2276 | 83 10 19 | 2294 |
| 20 | Fomalhaut W. | 101 21 38 | 2248 | 103 1 44 | 2229 | 104 41 21 | 2291 | 106 20 28 | 2214 |
| | Jupiter W. | 95 29 51 | 2225 | 97 14 16 | 2224 | 98 58 14 | 2403 | 100 41 44 | 2422 |
| | α Pegasi W. | 81 52 5 | 2274 | 83 27 7 | 2282 | 85 1 49 | 2207 | 86 36 8 | 2225 |
| | α Arietis W. | 38 27 9 | 2208 | 40 5 53 | 2210 | 41 44 34 | 2215 | 43 23 9 | 2220 |
| | Pollux E. | 38 2 17 | 2220 | 36 18 14 | 2401 | 34 34 40 | 2420 | 32 51 34 | 2440 |
| | Regulus E. | 74 24 4 | 2227 | 72 40 10 | 2405 | 70 56 43 | 2425 | 69 13 44 | 2445 |
| | Sun E. | 133 22 48 | 2701 | 131 46 9 | 2720 | 130 9 56 | 2741 | 128 31 10 | 2761 |

| GREENWICH MEAN TIME. | | | | | | | | | |
|----------------------|-------------------------------|-------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|
| LUNAR DISTANCES. | | | | | | | | | |
| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
| 21 | Fomalhaut W. | 107° 59' 4" | 9636 | 109° 37' 10" | 9680 | 111° 14' 44" | 9683 | 112° 51' 47" | 9707 |
| | JUPITER W. | 102 24 47 | 9443 | 104 7 22 | 9461 | 105 49 30 | 9480 | 107 31 11 | 9499 |
| | α Pegasi W. | 88 10 4 | 9843 | 89 43 36 | 9889 | 91 16 44 | 9881 | 92 49 27 | 9901 |
| | α Arietis W. | 45 1 37 | 9698 | 46 39 54 | 9636 | 48 18 0 | 9646 | 49 55 52 | 9658 |
| | Pollux E. | 31 8 56 | 9460 | 29 26 47 | 9489 | 27 45 8 | 9509 | 26 3 58 | 9594 |
| | Regulus E. | 67 31 13 | 9464 | 65 49 9 | 9484 | 64 7 33 | 9503 | 62 26 24 | 9522 |
| 22 | Sun E. | 126 58 51 | 9781 | 125 23 58 | 9801 | 123 49 32 | 9821 | 122 15 32 | 9842 |
| | α Pegasi W. | 100 26 21 | 3011 | 101 56 20 | 3034 | 103 25 50 | 3059 | 104 54 50 | 3082 |
| | α Arietis W. | 58 1 2 | 9794 | 59 37 10 | 9738 | 61 12 59 | 9753 | 62 48 29 | 9766 |
| | Aldebaran W. | 27 20 16 | 9798 | 28 56 19 | 9739 | 30 32 16 | 9740 | 32 8 3 | 9749 |
| | Regulus E. | 54 7 27 | 9891 | 52 29 0 | 9840 | 50 51 0 | 9860 | 49 13 26 | 9879 |
| | Sun E. | 114 32 3 | 9943 | 113 0 38 | 9962 | 111 29 38 | 9981 | 109 59 2 | 3001 |
| 23 | α Pegasi W. | 112 12 12 | 3214 | 113 38 4 | 3242 | 115 3 23 | 3271 | 116 28 8 | 3301 |
| | α Arietis W. | 70 41 13 | 9841 | 72 14 48 | 9855 | 73 48 4 | 9869 | 75 21 2 | 9884 |
| | Aldebaran W. | 40 3 38 | 9805 | 41 37 59 | 9817 | 43 12 5 | 9839 | 44 45 55 | 9842 |
| | Regulus E. | 41 12 1 | 9775 | 39 37 0 | 9793 | 38 2 23 | 9812 | 36 28 11 | 9831 |
| | Sun E. | 102 31 57 | 3094 | 101 3 40 | 3112 | 99 35 45 | 3129 | 98 8 11 | 3146 |
| 24 | α Arietis W. | 83 1 20 | 9953 | 84 32 32 | 9966 | 86 3 27 | 9978 | 87 34 7 | 9991 |
| | Aldebaran W. | 52 31 1 | 9904 | 54 3 15 | 9916 | 55 35 14 | 9927 | 57 6 59 | 9939 |
| | Regulus E. | 28 43 22 | 9999 | 27 11 40 | 9950 | 25 40 25 | 9973 | 24 9 38 | 9997 |
| | Sun E. | 90 55 17 | 3225 | 89 29 38 | 3240 | 88 4 16 | 3254 | 86 39 11 | 3269 |
| 25 | α Arietis W. | 95 3 39 | 3049 | 96 32 51 | 3060 | 98 1 50 | 3070 | 99 30 36 | 3080 |
| | Aldebaran W. | 64 42 15 | 9990 | 66 12 40 | 3000 | 67 42 53 | 3009 | 69 12 55 | 3017 |
| | Pollux W. | 20 26 31 | 9985 | 21 57 3 | 9991 | 23 27 27 | 9998 | 24 57 42 | 3005 |
| | Sun E. | 79 37 38 | 3330 | 78 14 1 | 3341 | 76 50 37 | 3353 | 75 27 26 | 3362 |
| 26 | α Arietis W. | 106 51 31 | 3126 | 108 19 9 | 3134 | 109 46 37 | 3143 | 111 13 55 | 3150 |
| | Aldebaran W. | 76 40 36 | 3055 | 78 9 41 | 3060 | 79 38 39 | 3068 | 81 7 30 | 3072 |
| | Pollux W. | 32 26 53 | 3037 | 33 56 20 | 3043 | 35 25 40 | 3048 | 36 54 53 | 3053 |
| | Sun E. | 68 34 10 | 3405 | 67 11 59 | 3412 | 65 49 56 | 3419 | 64 28 1 | 3425 |
| 27 | Aldebaran W. | 88 30 12 | 3093 | 89 58 30 | 3097 | 91 26 43 | 3100 | 92 54 53 | 3103 |
| | Pollux W. | 44 19 35 | 3073 | 45 48 18 | 3076 | 47 16 57 | 3078 | 48 45 33 | 3081 |
| | Sun E. | 57 40 1 | 3450 | 56 18 41 | 3454 | 54 57 25 | 3456 | 53 36 12 | 3460 |
| 28 | Aldebaran W. | 100 15 2 | 3110 | 101 42 59 | 3110 | 103 10 56 | 3111 | 104 38 52 | 3119 |
| | Pollux W. | 56 8 2 | 3086 | 57 36 29 | 3087 | 59 4 55 | 3087 | 60 33 21 | 3088 |
| | Regulus W. | 20 16 38 | 3901 | 21 42 46 | 3188 | 23 9 10 | 3175 | 24 35 49 | 3165 |
| | Sun E. | 47 50 48 | 3468 | 45 29 48 | 3468 | 44 8 48 | 3468 | 42 47 48 | 3468 |
| 29 | Aldebaran W. | 111 58 35 | 3108 | 113 26 35 | 3107 | 114 54 36 | 3105 | 116 22 40 | 3103 |
| | Pollux W. | 67 55 49 | 3078 | 69 24 25 | 3077 | 70 53 3 | 3074 | 72 21 44 | 3071 |
| | Regulus W. | 31 51 44 | 3127 | 33 19 21 | 3121 | 34 47 5 | 3115 | 36 14 56 | 3110 |
| | Sun E. | 36 2 38 | 3463 | 34 41 32 | 3460 | 33 20 23 | 3458 | 31 59 12 | 3455 |
| 30 | Pollux W. | 79 46 6 | 3054 | 81 15 12 | 3051 | 82 44 22 | 3046 | 84 13 38 | 3042 |
| | Regulus W. | 43 35 53 | 3082 | 45 4 25 | 3077 | 46 33 3 | 3070 | 48 1 49 | 3065 |
| | Sun E. | 25 12 31 | 3440 | 23 51 0 | 3438 | 22 29 26 | 3434 | 21 7 48 | 3431 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
| 21 | Fomalhaut W. | 114 26 17 | 9739 | 116 4 15 | 9756 | 117 30 40 | 9789 | 119 14 31 | 9808 |
| | Jupiter W. | 109 12 25 | 9519 | 110 53 12 | 9538 | 112 33 32 | 9557 | 114 13 26 | 9577 |
| | α Pegasi W. | 94 21 44 | 9899 | 95 53 35 | 9944 | 97 24 58 | 9965 | 98 55 54 | 9989 |
| | α Arietis W. | 51 33 28 | 9870 | 53 10 48 | 9883 | 54 47 51 | 9896 | 56 24 36 | 9709 |
| | Pollux E. | 24 23 18 | 9545 | 22 43 8 | 9568 | 21 3 29 | 9591 | 19 24 22 | 9615 |
| | Regulus E. | 60 45 42 | 9549 | 59 5 27 | 9569 | 57 25 40 | 9589 | 55 46 20 | 9601 |
| | Sun E. | 120 41 58 | 9899 | 119 8 50 | 9883 | 117 36 9 | 9909 | 116 3 53 | 9923 |
| 22 | α Pegasi W. | 106 23 21 | 3108 | 107 51 21 | 3133 | 109 18 50 | 3160 | 110 45 47 | 3187 |
| | α Arietis W. | 64 23 41 | 9789 | 65 58 33 | 9796 | 67 33 6 | 9811 | 69 7 19 | 9896 |
| | Aldebaran W. | 33 43 38 | 9759 | 35 19 0 | 9769 | 36 54 8 | 9781 | 38 29 1 | 9793 |
| | Regulus E. | 47 36 18 | 9698 | 45 59 36 | 9717 | 44 23 19 | 9736 | 42 47 27 | 9756 |
| | Sun E. | 108 28 50 | 3090 | 106 59 2 | 3039 | 105 29 37 | 3058 | 104 0 36 | 3076 |
| 23 | α Pegasi W. | 117 52 18 | 3339 | 119 15 52 | 3364 | 120 38 50 | 3396 | 122 1 11 | 3430 |
| | α Arietis W. | 76 53 41 | 9898 | 78 26 2 | 9919 | 79 58 6 | 9936 | 81 29 52 | 9940 |
| | Aldebaran W. | 46 19 28 | 9855 | 47 52 45 | 9867 | 49 25 46 | 9880 | 50 58 31 | 9891 |
| | Regulus E. | 34 54 25 | 9851 | 33 21 1 | 9869 | 31 48 3 | 9889 | 30 15 30 | 9909 |
| | Sun E. | 96 40 57 | 3163 | 95 14 3 | 3179 | 93 47 29 | 3195 | 92 21 14 | 3210 |
| 24 | α Arietis W. | 89 4 31 | 3003 | 90 34 40 | 3015 | 92 4 34 | 3036 | 93 34 14 | 3039 |
| | Aldebaran W. | 58 38 29 | 9950 | 60 9 45 | 9960 | 61 40 48 | 9970 | 63 11 38 | 9981 |
| | Regulus E. | 22 39 22 | 3093 | 21 9 38 | 3058 | 19 40 29 | 3089 | 18 11 58 | 3118 |
| | Sun E. | 85 14 23 | 3989 | 83 49 50 | 3994 | 82 25 32 | 3996 | 81 1 28 | 3319 |
| 25 | α Arietis W. | 100 59 10 | 3090 | 102 27 32 | 3099 | 103 55 43 | 3109 | 105 23 42 | 3117 |
| | Aldebaran W. | 70 42 47 | 3096 | 72 12 28 | 3033 | 73 42 0 | 3041 | 75 11 22 | 3047 |
| | Pollux W. | 26 27 49 | 3019 | 27 57 47 | 3018 | 29 27 37 | 3025 | 30 57 19 | 3031 |
| | Sun E. | 74 4 26 | 3379 | 72 41 37 | 3381 | 71 18 59 | 3389 | 69 56 30 | 3397 |
| 26 | α Arietis W. | 112 41 4 | 3158 | 114 8 3 | 3165 | 115 34 54 | 3173 | 117 1 36 | 3179 |
| | Aldebaran W. | 82 36 14 | 3077 | 84 4 52 | 3069 | 85 33 24 | 3087 | 87 1 50 | 3090 |
| | Pollux W. | 38 24 0 | 3058 | 39 53 1 | 3069 | 41 21 57 | 3066 | 42 50 48 | 3069 |
| | Sun E. | 63 6 13 | 3431 | 61 44 31 | 3437 | 60 22 56 | 3441 | 59 1 26 | 3446 |
| 27 | Aldebaran W. | 94 22 59 | 3105 | 95 51 3 | 3107 | 97 19 4 | 3108 | 98 47 4 | 3110 |
| | Pollux W. | 50 14 6 | 3082 | 51 42 37 | 3083 | 53 11 7 | 3085 | 54 39 35 | 3086 |
| | Sun E. | 52 15 3 | 3462 | 50 53 56 | 3464 | 49 32 52 | 3465 | 48 11 49 | 3467 |
| 28 | Aldebaran W. | 106 6 47 | 3111 | 107 34 43 | 3111 | 109 2 39 | 3110 | 110 30 37 | 3110 |
| | Pollux W. | 62 1 48 | 3085 | 63 30 16 | 3084 | 64 58 45 | 3089 | 66 27 16 | 3081 |
| | Regulus W. | 26 2 40 | 3156 | 27 29 42 | 3148 | 28 56 54 | 3140 | 30 24 15 | 3134 |
| | Sun E. | 41 26 48 | 3467 | 40 5 47 | 3466 | 38 44 45 | 3465 | 37 23 42 | 3464 |
| 29 | Aldebaran W. | 117 50 46 | 3101 | 119 18 54 | 3099 | 120 47 5 | 3097 | 122 15 18 | 3095 |
| | Pollux W. | 73 50 29 | 3089 | 75 19 17 | 3065 | 76 48 9 | 3082 | 78 17 5 | 3058 |
| | Regulus W. | 37 42 54 | 3104 | 39 10 59 | 3099 | 40 39 10 | 3093 | 42 7 28 | 3087 |
| | Sun E. | 30 37 58 | 3453 | 29 16 41 | 3450 | 27 55 21 | 3447 | 26 33 58 | 3444 |
| 30 | Pollux W. | 85 42 59 | 3037 | 87 12 26 | 3033 | 88 41 58 | 3097 | 90 11 37 | 3099 |
| | Regulus W. | 49 30 41 | 3060 | 50 59 40 | 3053 | 52 28 47 | 3047 | 53 58 1 | 3041 |
| | Sun E. | 19 46 6 | 3498 | 18 24 21 | 3494 | 17 2 32 | 3493 | 15 40 41 | 3490 |

AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | Sideral Time of Semi-diameter Passing Meridian. | Equation of Time, to be Subtracted from Apparent Time. | Diff. for 1 Hour. |
|------------------|-------------------|--|-------------------|---|-------------------|---------------------------|---|--|-------------------|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | Semi-diameter. | | | |
| | | ^h ^m ^s | ^s | S. [°] ['] ["] | ["] | ['] ["] | ^s | ^m ^s | ^s |
| SUN. | 1 | 14 25 34.58 | 9.799 | S. 14 26 10.8 | -48.14 | 16 9.71 | 66.93 | 16 19.52 | 0.057 |
| Mon. | 2 | 14 29 30.16 | 9.833 | 14 45 19.4 | 47.56 | 16 9.96 | 67.05 | 16 20.49 | 0.023 |
| Tues. | 3 | 14 33 26.55 | 9.867 | 15 4 13.6 | 46.95 | 16 10.21 | 67.16 | 16 20.65 | 0.010 |
| Wed. | 4 | 14 37 23.75 | 9.901 | 15 22 52.9 | -46.32 | 16 10.46 | 67.28 | 16 20.01 | 0.044 |
| Thur. | 5 | 14 41 21.76 | 9.934 | 15 41 17.0 | 45.68 | 16 10.71 | 67.40 | 16 18.56 | 0.077 |
| Frid. | 6 | 14 45 20.59 | 9.968 | 15 59 25.4 | 45.02 | 16 10.95 | 67.52 | 16 16.29 | 0.111 |
| Sat. | 7 | 14 49 20.24 | 10.002 | 16 17 17.7 | -44.34 | 16 11.19 | 67.64 | 16 13.20 | 0.145 |
| SUN. | 8 | 14 53 20.72 | 10.036 | 16 34 53.5 | 43.64 | 16 11.43 | 67.76 | 16 9.29 | 0.180 |
| Mon. | 9 | 14 57 22.02 | 10.070 | 16 52 12.4 | 42.93 | 16 11.67 | 67.88 | 16 4.55 | 0.214 |
| Tues. | 10 | 15 1 24.16 | 10.106 | 17 9 14.0 | -42.20 | 16 11.90 | 68.00 | 15 58.98 | 0.249 |
| Wed. | 11 | 15 5 27.13 | 10.141 | 17 25 57.9 | 41.45 | 16 12.14 | 68.12 | 15 52.58 | 0.283 |
| Thur. | 12 | 15 9 30.94 | 10.176 | 17 42 23.7 | 40.69 | 16 12.36 | 68.24 | 15 45.35 | 0.318 |
| Frid. | 13 | 15 13 35.58 | 10.211 | 17 58 31.1 | -39.91 | 16 12.58 | 68.36 | 15 37.29 | 0.353 |
| Sat. | 14 | 15 17 41.06 | 10.246 | 18 14 19.5 | 39.11 | 16 12.80 | 68.48 | 15 28.39 | 0.388 |
| SUN. | 15 | 15 21 47.38 | 10.281 | 18 29 48.7 | 38.30 | 16 13.02 | 68.60 | 15 18.66 | 0.423 |
| Mon. | 16 | 15 25 54.54 | 10.316 | 18 44 58.4 | -37.47 | 16 13.23 | 68.71 | 15 8.09 | 0.458 |
| Tues. | 17 | 15 30 2.55 | 10.351 | 18 59 48.1 | 36.63 | 16 13.43 | 68.83 | 14 56.66 | 0.493 |
| Wed. | 18 | 15 34 11.40 | 10.386 | 19 14 17.4 | 35.78 | 16 13.63 | 68.94 | 14 44.40 | 0.528 |
| Thur. | 19 | 15 38 21.09 | 10.421 | 19 28 26.1 | -34.91 | 16 13.83 | 69.06 | 14 31.31 | 0.563 |
| Frid. | 20 | 15 42 31.61 | 10.455 | 19 42 13.8 | 34.03 | 16 14.03 | 69.17 | 14 17.39 | 0.597 |
| Sat. | 21 | 15 46 42.96 | 10.489 | 19 55 40.0 | 33.13 | 16 14.22 | 69.28 | 14 2.64 | 0.631 |
| SUN. | 22 | 15 50 55.14 | 10.523 | 20 8 44.4 | -32.23 | 16 14.40 | 69.39 | 13 47.06 | 0.665 |
| Mon. | 23 | 15 55 8.13 | 10.557 | 20 21 26.8 | 31.30 | 16 14.58 | 69.50 | 13 30.67 | 0.699 |
| Tues. | 24 | 15 59 21.91 | 10.591 | 20 33 46.8 | 30.35 | 16 14.75 | 69.61 | 13 13.49 | 0.732 |
| Wed. | 25 | 16 3 36.49 | 10.624 | 20 45 44.0 | -29.39 | 16 14.92 | 69.72 | 12 55.52 | 0.765 |
| Thur. | 26 | 16 7 51.85 | 10.656 | 20 57 18.1 | 28.42 | 16 15.09 | 69.82 | 12 36.77 | 0.797 |
| Frid. | 27 | 16 12 7.96 | 10.687 | 21 8 28.6 | 27.43 | 16 15.26 | 69.92 | 12 17.27 | 0.828 |
| Sat. | 28 | 16 16 24.80 | 10.717 | 21 19 15.1 | -26.43 | 16 15.42 | 70.02 | 11 57.04 | 0.858 |
| SUN. | 29 | 16 20 42.37 | 10.746 | 21 29 37.5 | 25.42 | 16 15.58 | 70.11 | 11 36.09 | 0.887 |
| Mon. | 30 | 16 25 0.64 | 10.775 | 21 39 35.4 | 24.39 | 16 15.74 | 70.20 | 11 14.43 | 0.916 |
| Tues. | 31 | 16 29 19.58 | 10.802 | S. 21 49 8.5 | -23.35 | 16 15.89 | 70.29 | 10 52.11 | 0.943 |

NOTE.—The mean time of semidiameter passing may be found by subtracting 0°.19 from the sideral time.

The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, to be Added to Mean Time. | Diff. for 1 Hour. | Sidereal Time, or Right Ascension of Mean Sun. |
|------------------|-------------------|--|--------------------|--|-------------------|---|--------------------|--|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | | | |
| <i>SUN.</i> | 1 | ^h 14 ^m 25 ^s 37.26 | ^s 9.800 | S. ^o 14 ['] 26 ["] 23.9 | —48.14 | ^m 16 ^s 19.53 | ^s 0.057 | ^h 14 ^m 41 ^s 56.79 |
| Mon. | 2 | 14 29 32.85 | 9.834 | 14 45 32.3 | 47.55 | 16 20.49 | 0.023 | 14 45 53.34 |
| Tues. | 3 | 14 33 29.25 | 9.867 | 15 4 26.3 | 46.94 | 16 20.64 | 0.010 | 14 49 49.89 |
| Wed. | 4 | 14 37 26.46 | 9.901 | 15 23 5.5 | —46.31 | 16 19.99 | 0.044 | 14 53 46.45 |
| Thur. | 5 | 14 41 24.48 | 9.934 | 15 41 29.4 | 45.67 | 16 18.53 | 0.077 | 14 57 43.01 |
| Frid. | 6 | 14 45 23.31 | 9.968 | 15 59 37.6 | 45.01 | 16 16.25 | 0.111 | 15 1 39.56 |
| Sat. | 7 | 14 49 22.96 | 10.002 | 16 17 29.7 | —44.33 | 16 13.15 | 0.145 | 15 5 36.11 |
| <i>SUN.</i> | 8 | 14 53 23.44 | 10.037 | 16 35 5.3 | 43.63 | 16 9.23 | 0.180 | 15 9 32.67 |
| Mon. | 9 | 14 57 24.74 | 10.071 | 16 52 23.9 | 42.92 | 16 4.49 | 0.214 | 15 13 29.23 |
| Tues. | 10 | 15 1 26.87 | 10.106 | 17 9 25.3 | —42.19 | 15 58.91 | 0.249 | 15 17 25.78 |
| Wed. | 11 | 15 5 29.84 | 10.141 | 17 26 8.9 | 41.44 | 15 52.50 | 0.283 | 15 21 22.34 |
| Thur. | 12 | 15 9 33.63 | 10.175 | 17 42 34.4 | 40.68 | 15 45.26 | 0.318 | 15 25 18.89 |
| Frid. | 13 | 15 13 38.26 | 10.210 | 17 58 41.4 | —39.90 | 15 37.19 | 0.353 | 15 29 15.45 |
| Sat. | 14 | 15 17 43.72 | 10.245 | 18 14 29.6 | 39.10 | 15 28.29 | 0.388 | 15 33 12.01 |
| <i>SUN.</i> | 15 | 15 21 50.02 | 10.280 | 18 29 58.5 | 38.29 | 15 18.55 | 0.423 | 15 37 8.57 |
| Mon. | 16 | 15 25 57.16 | 10.315 | 18 45 7.8 | —37.46 | 15 7.97 | 0.458 | 15 41 5.13 |
| Tues. | 17 | 15 30 5.14 | 10.350 | 18 59 57.2 | 36.62 | 14 56.54 | 0.493 | 15 45 1.68 |
| Wed. | 18 | 15 34 13.96 | 10.385 | 19 14 26.2 | 35.77 | 14 44.27 | 0.528 | 15 48 58.23 |
| Thur. | 19 | 15 38 23.62 | 10.420 | 19 28 34.6 | —34.90 | 14 31.17 | 0.563 | 15 52 54.79 |
| Frid. | 20 | 15 42 34.11 | 10.454 | 19 42 21.9 | 34.02 | 14 17.24 | 0.597 | 15 56 51.35 |
| Sat. | 21 | 15 46 45.42 | 10.488 | 19 55 47.8 | 33.12 | 14 2.48 | 0.631 | 16 0 47.90 |
| <i>SUN.</i> | 22 | 15 50 57.56 | 10.522 | 20 8 51.9 | —32.21 | 13 46.90 | 0.665 | 16 4 44.46 |
| Mon. | 23 | 15 55 10.51 | 10.556 | 20 21 33.8 | 31.28 | 13 30.51 | 0.699 | 16 8 41.02 |
| Tues. | 24 | 15 59 24.25 | 10.589 | 20 33 53.4 | 30.34 | 13 13.33 | 0.732 | 16 12 37.58 |
| Wed. | 25 | 16 3 38.78 | 10.622 | 20 45 50.3 | —29.38 | 12 55.36 | 0.765 | 16 16 34.14 |
| Thur. | 26 | 16 7 54.09 | 10.654 | 20 57 24.0 | 28.41 | 12 36.61 | 0.797 | 16 20 30.70 |
| Frid. | 27 | 16 12 10.15 | 10.685 | 21 8 34.1 | 27.42 | 12 17.10 | 0.828 | 16 24 27.25 |
| Sat. | 28 | 16 16 26.94 | 10.715 | 21 19 20.3 | —26.42 | 11 56.87 | 0.858 | 16 28 23.81 |
| <i>SUN.</i> | 29 | 16 20 44.45 | 10.744 | 21 29 42.4 | 25.41 | 11 35.92 | 0.887 | 16 32 20.37 |
| Mon. | 30 | 16 25 2.66 | 10.773 | 21 39 40.0 | 24.38 | 11 14.26 | 0.916 | 16 36 16.92 |
| Tues. | 31 | 16 29 21.54 | 10.800 | S. 21 49 12.7 | —23.34 | 10 51.94 | 0.943 | 16 40 13.48 |

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,
+9^m.8565.
(Table III.)

| AT GREENWICH MEAN NOON. | | | | | | | | |
|--|------------------|-----------------|------------|----------------------|-----------|--|----------------------|--|
| Day of the Month. | Day of the Year. | THE SUN'S | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 Hour. | Mean Time of Sidereal Noon. |
| | | TRUE LONGITUDE. | | Diff. for 1 Hour. | LATITUDE. | | | |
| | | λ | λ' | | | | | |
| 1 | 305 | 218° 47' 55.5" | 47° 29.1" | 150.27 | + 0.08 | 9.9965327 | -46.5 | ^h 9 ^m 16 ^s 31.79 |
| 2 | 306 | 219 48 3.0 | 47 36.5 | 150.35 | - 0.05 | 9.9964211 | 46.4 | 9 12 35.88 |
| 3 | 307 | 220 48 12.3 | 47 45.7 | 150.42 | 0.18 | 9.9963100 | 46.2 | 9 8 39.97 |
| 4 | 308 | 221 48 23.3 | 47 56.5 | 150.49 | - 0.31 | 9.9961994 | -46.0 | 9 4 44.06 |
| 5 | 309 | 222 48 35.8 | 48 8.9 | 150.56 | 0.43 | 9.9960894 | 45.7 | 9 0 48.15 |
| 6 | 310 | 223 48 49.9 | 48 22.8 | 150.62 | 0.53 | 9.9959802 | 45.4 | 8 56 52.24 |
| 7 | 311 | 224 49 5.6 | 48 38.4 | 150.68 | - 0.60 | 9.9958718 | -45.0 | 8 52 56.34 |
| 8 | 312 | 225 49 22.8 | 48 55.5 | 150.74 | 0.65 | 9.9957643 | 44.6 | 8 49 0.43 |
| 9 | 313 | 226 49 41.4 | 49 14.0 | 150.80 | 0.67 | 9.9956580 | 44.0 | 8 45 4.52 |
| 10 | 314 | 227 50 1.4 | 49 33.8 | 150.86 | - 0.66 | 9.9955531 | -43.4 | 8 41 8.61 |
| 11 | 315 | 228 50 22.9 | 49 55.1 | 150.92 | 0.62 | 9.9954497 | 42.7 | 8 37 12.70 |
| 12 | 316 | 229 50 45.7 | 50 17.8 | 150.98 | 0.55 | 9.9953479 | 42.0 | 8 33 16.79 |
| 13 | 317 | 230 51 10.0 | 50 41.9 | 151.04 | - 0.46 | 9.9952479 | -41.2 | 8 29 20.88 |
| 14 | 318 | 231 51 35.8 | 51 7.5 | 151.10 | 0.35 | 9.9951498 | 40.4 | 8 25 24.97 |
| 15 | 319 | 232 52 3.0 | 51 34.5 | 151.16 | 0.22 | 9.9950538 | 39.6 | 8 21 29.05 |
| 16 | 320 | 233 52 31.7 | 52 3.1 | 151.23 | - 0.09 | 9.9949598 | -38.9 | 8 17 33.14 |
| 17 | 321 | 234 53 2.0 | 52 33.3 | 151.29 | + 0.04 | 9.9948679 | 38.0 | 8 13 37.23 |
| 18 | 322 | 235 53 33.9 | 53 5.1 | 151.36 | 0.16 | 9.9947780 | -37.1 | 8 9 41.32 |
| 19 | 323 | 236 54 7.5 | 53 38.5 | 151.43 | + 0.27 | 9.9946902 | -36.2 | 8 5 45.41 |
| 20 | 324 | 237 54 42.7 | 54 13.5 | 151.50 | 0.36 | 9.9946045 | 35.3 | 8 1 49.50 |
| 21 | 325 | 238 55 19.6 | 54 50.2 | 151.57 | 0.42 | 9.9945207 | 34.5 | 7 57 53.59 |
| 22 | 326 | 239 55 58.1 | 55 28.6 | 151.64 | + 0.45 | 9.9944389 | -33.7 | 7 53 57.68 |
| 23 | 327 | 240 56 38.3 | 56 8.6 | 151.71 | 0.45 | 9.9943590 | 32.9 | 7 50 1.76 |
| 24 | 328 | 241 57 20.2 | 56 50.3 | 151.78 | 0.43 | 9.9942809 | 32.2 | 7 46 5.85 |
| 25 | 329 | 242 58 3.8 | 57 33.7 | 151.85 | + 0.38 | 9.9942043 | -31.6 | 7 42 9.94 |
| 26 | 330 | 243 58 49.0 | 58 18.7 | 151.92 | 0.30 | 9.9941292 | 31.0 | 7 38 14.03 |
| 27 | 331 | 244 59 35.7 | 59 5.2 | 151.98 | 0.20 | 9.9940555 | 30.4 | 7 34 18.12 |
| 28 | 332 | 245 60 23.8 | 59 53.2 | 152.04 | + 0.08 | 9.9939832 | -29.9 | 7 30 22.21 |
| 29 | 333 | 247 1 13.4 | 0 42.6 | 152.10 | - 0.05 | 9.9939122 | 29.3 | 7 26 26.30 |
| 30 | 334 | 248 2 4.3 | 1 33.3 | 152.15 | 0.18 | 9.9938425 | 28.8 | 7 22 30.39 |
| 31 | 335 | 249 2 56.4 | 2 25.2 | 152.20 | - 0.31 | 9.9937740 | -28.2 | 7 18 34.47 |
| NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^d .0. | | | | | | | | Diff. for 1 Hour, —9 ^s .8296. (Table II.) |

GREENWICH MEAN TIME.

THE MOON'S

| Day of the Month. | THE MOON'S | | | | | | | | |
|-------------------|--------------------|-----------|----------------------|----------------------|-----------|----------------------|---------------------------|----------------------|-------|
| | SEMI- DIAMETER. | | HORIZONTAL PARALLAX. | | | | UPPER TRANSIT. | | AGE. |
| | Noon. | Midnight. | Noon. | Diff. for 1 Hour. | Midnight. | Diff. for 1 Hour. | Meridian of Greenwich. | Diff. for 1 Hour. | Noon. |
| 1 | 14' 53.9 | 14' 56.5 | 54' 33.9 | +0.77 | 54' 43.6 | +0.85 | h m 6 | m | 29.5 |
| 2 | 14 59.4 | 15 2.5 | 54 54.1 | 0.91 | 55 5.5 | 0.99 | 0 17.3 | 1.88 | 0.7 |
| 3 | 15 5.8 | 15 9.3 | 55 17.7 | 1.05 | 55 30.6 | 1.11 | 1 4.0 | 2.02 | 1.7 |
| 4 | 15 13.1 | 15 17.0 | 55 44.3 | +1.17 | 55 58.7 | +1.24 | 1 54.2 | 2.19 | 2.7 |
| 5 | 15 21.1 | 15 25.5 | 56 13.9 | 1.30 | 56 29.8 | 1.36 | 2 47.6 | 2.28 | 3.7 |
| 6 | 15 30.0 | 15 34.7 | 56 46.4 | 1.42 | 57 3.7 | 1.47 | 3 43.6 | 2.34 | 4.7 |
| 7 | 15 39.6 | 15 44.6 | 57 21.6 | +1.52 | 57 40.2 | +1.57 | 4 40.5 | 2.36 | 5.7 |
| 8 | 15 49.8 | 15 55.0 | 57 59.2 | 1.60 | 58 18.4 | 1.61 | 5 36.8 | 2.31 | 6.7 |
| 9 | 16 0.3 | 16 5.5 | 58 37.7 | 1.61 | 58 56.9 | 1.57 | 6 31.5 | 2.24 | 7.7 |
| 10 | 16 10.5 | 16 15.3 | 59 15.4 | +1.50 | 59 32.9 | +1.41 | 7 24.2 | 2.16 | 8.7 |
| 11 | 16 19.7 | 16 23.6 | 59 49.0 | 1.27 | 60 3.3 | 1.10 | 8 15.3 | 2.11 | 9.7 |
| 12 | 16 26.8 | 16 29.3 | 60 15.2 | 0.88 | 60 24.3 | 0.62 | 9 5.7 | 2.11 | 10.7 |
| 13 | 16 30.9 | 16 31.5 | 60 30.1 | +0.34 | 60 32.5 | +0.04 | 9 56.6 | 2.15 | 11.7 |
| 14 | 16 31.1 | 16 29.7 | 60 31.0 | -0.29 | 60 25.7 | -0.61 | 10 49.0 | 2.23 | 12.7 |
| 15 | 16 27.2 | 16 23.6 | 60 16.4 | 0.93 | 60 3.4 | 1.23 | 11 43.8 | 2.34 | 13.7 |
| 16 | 16 19.1 | 16 13.8 | 59 47.0 | -1.50 | 59 27.5 | -1.74 | 12 41.3 | 2.43 | 14.7 |
| 17 | 16 7.8 | 16 1.3 | 59 5.4 | 1.93 | 58 41.3 | 2.07 | 13 40.5 | 2.47 | 15.7 |
| 18 | 15 54.3 | 15 47.2 | 58 15.8 | 2.16 | 57 49.6 | 2.20 | 14 39.8 | 2.43 | 16.7 |
| 19 | 15 40.0 | 15 32.8 | 57 23.1 | -2.20 | 56 56.9 | -2.16 | 15 37.3 | 2.32 | 17.7 |
| 20 | 15 25.9 | 15 19.4 | 56 31.5 | 2.07 | 56 7.4 | 1.94 | 16 31.2 | 2.16 | 18.7 |
| 21 | 15 13.3 | 15 7.7 | 55 45.0 | 1.79 | 55 24.5 | 1.62 | 17 21.0 | 1.99 | 19.7 |
| 22 | 15 2.7 | 14 58.3 | 55 6.2 | -1.44 | 54 50.2 | -1.23 | 18 6.9 | 1.85 | 20.7 |
| 23 | 14 54.7 | 14 51.7 | 54 36.8 | 1.01 | 54 25.9 | 0.80 | 18 49.7 | 1.74 | 21.7 |
| 24 | 14 49.5 | 14 47.9 | 54 17.6 | 0.59 | 54 11.9 | -0.37 | 19 30.3 | 1.67 | 22.7 |
| 25 | 14 47.1 | 14 46.9 | 54 8.8 | -0.16 | 54 8.2 | +0.05 | 20 9.8 | 1.65 | 23.7 |
| 26 | 14 47.4 | 14 48.4 | 54 9.9 | +0.24 | 54 13.8 | 0.41 | 20 49.4 | 1.67 | 24.7 |
| 27 | 14 50.1 | 14 52.2 | 54 19.8 | 0.58 | 54 27.6 | 0.73 | 21 30.1 | 1.74 | 25.7 |
| 28 | 14 54.8 | 14 57.7 | 54 37.1 | +0.85 | 54 48.0 | +0.97 | 22 13.0 | 1.85 | 26.7 |
| 29 | 15 1.1 | 15 4.7 | 55 0.2 | 1.06 | 55 13.4 | 1.13 | 22 58.9 | 1.99 | 27.7 |
| 30 | 15 8.4 | 15 12.4 | 55 27.3 | 1.19 | 55 41.8 | 1.23 | 23 48.5 | 2.14 | 28.7 |
| 31 | 15 16.4 | 15 20.5 | 55 56.7 | +1.25 | 56 11.7 | +1.26 | 6 | | 0.0 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-----------|------------------|---------------------|-----------------|---------------------|--------------|------------------|---------------------|-----------------|---------------------|
| SUNDAY 1. | | | | | TUESDAY 3. | | | | |
| 0 | 14 16 20.13 | 1.8806 | S. 11° 43' 7.3" | 12.405 | 0 | 15 51 44.93 | 2.1096 | S. 20° 34' 7.4" | 9.317 |
| 1 | 14 18 13.08 | 1.8843 | 11 55 30.4 | 12.364 | 1 | 15 53 51.67 | 2.1151 | 20 43 23.7 | 9.298 |
| 2 | 14 20 6.25 | 1.8881 | 12 7 51.0 | 12.323 | 2 | 15 55 58.75 | 2.1207 | 20 52 34.5 | 9.133 |
| 3 | 14 21 59.65 | 1.8919 | 12 20 9.1 | 12.281 | 3 | 15 58 6.16 | 2.1263 | 21 1 39.7 | 9.040 |
| 4 | 14 23 53.28 | 1.8958 | 12 32 24.7 | 12.238 | 4 | 16 0 13.90 | 2.1317 | 21 10 39.3 | 8.946 |
| 5 | 14 25 47.15 | 1.8998 | 12 44 37.6 | 12.193 | 5 | 16 2 21.97 | 2.1373 | 21 19 33.2 | 8.850 |
| 6 | 14 27 41.26 | 1.9038 | 12 56 47.8 | 12.148 | 6 | 16 4 30.98 | 2.1429 | 21 28 21.3 | 8.753 |
| 7 | 14 29 35.61 | 1.9078 | 13 8 55.3 | 12.102 | 7 | 16 6 39.12 | 2.1484 | 21 37 3.6 | 8.656 |
| 8 | 14 31 30.20 | 1.9119 | 13 21 0.0 | 12.054 | 8 | 16 8 48.19 | 2.1539 | 21 45 40.0 | 8.557 |
| 9 | 14 33 25.04 | 1.9161 | 13 33 1.8 | 12.006 | 9 | 16 10 57.59 | 2.1595 | 21 54 10.5 | 8.457 |
| 10 | 14 35 20.13 | 1.9203 | 13 45 0.7 | 11.957 | 10 | 16 13 7.33 | 2.1651 | 22 2 34.9 | 8.356 |
| 11 | 14 37 15.48 | 1.9246 | 13 56 56.6 | 11.907 | 11 | 16 15 17.40 | 2.1706 | 22 10 53.2 | 8.254 |
| 12 | 14 39 11.08 | 1.9288 | 14 8 49.5 | 11.856 | 12 | 16 17 27.80 | 2.1761 | 22 19 5.4 | 8.151 |
| 13 | 14 41 6.94 | 1.9339 | 14 20 39.3 | 11.804 | 13 | 16 19 38.53 | 2.1817 | 22 27 11.3 | 8.046 |
| 14 | 14 43 3.06 | 1.9376 | 14 32 26.0 | 11.751 | 14 | 16 21 49.60 | 2.1872 | 22 35 10.9 | 7.941 |
| 15 | 14 44 59.45 | 1.9421 | 14 44 9.4 | 11.696 | 15 | 16 24 1.00 | 2.1927 | 22 43 4.2 | 7.834 |
| 16 | 14 46 56.11 | 1.9466 | 14 55 49.5 | 11.641 | 16 | 16 26 12.73 | 2.1982 | 22 50 51.0 | 7.726 |
| 17 | 14 48 53.04 | 1.9511 | 15 7 26.3 | 11.586 | 17 | 16 28 24.79 | 2.2037 | 22 58 31.3 | 7.617 |
| 18 | 14 50 50.24 | 1.9557 | 15 18 59.8 | 11.529 | 18 | 16 30 37.17 | 2.2091 | 23 6 5.1 | 7.507 |
| 19 | 14 52 47.72 | 1.9603 | 15 30 29.8 | 11.471 | 19 | 16 32 49.88 | 2.2146 | 23 13 32.2 | 7.396 |
| 20 | 14 54 45.48 | 1.9649 | 15 41 56.3 | 11.411 | 20 | 16 35 2.92 | 2.2201 | 23 20 52.6 | 7.284 |
| 21 | 14 56 43.51 | 1.9696 | 15 53 19.1 | 11.350 | 21 | 16 37 16.20 | 2.2255 | 23 28 6.3 | 7.171 |
| 22 | 14 58 41.83 | 1.9744 | 16 4 38.3 | 11.289 | 22 | 16 39 29.98 | 2.2308 | 23 35 13.1 | 7.056 |
| 23 | 15 0 40.44 | 1.9792 | S. 16 15 53.8 | 11.227 | 23 | 16 41 43.90 | 2.2362 | S. 23 42 13.0 | 6.941 |
| MONDAY 2. | | | | | WEDNESDAY 4. | | | | |
| 0 | 15 2 39.34 | 1.9841 | S. 16 27 5.5 | 11.163 | 0 | 16 43 58.33 | 2.2416 | S. 23 49 6.0 | 6.824 |
| 1 | 15 4 38.53 | 1.9889 | 16 38 13.3 | 11.099 | 1 | 16 46 12.00 | 2.2469 | 23 55 51.9 | 6.706 |
| 2 | 15 6 38.01 | 1.9938 | 16 49 17.3 | 11.034 | 2 | 16 48 27.96 | 2.2521 | 24 2 30.7 | 6.587 |
| 3 | 15 8 37.79 | 1.9987 | 17 0 17.4 | 10.968 | 3 | 16 50 43.24 | 2.2573 | 24 9 2.4 | 6.468 |
| 4 | 15 10 37.86 | 2.0037 | 17 11 13.5 | 10.900 | 4 | 16 52 58.84 | 2.2626 | 24 15 26.9 | 6.347 |
| 5 | 15 12 38.24 | 2.0088 | 17 22 5.4 | 10.830 | 5 | 16 55 14.75 | 2.2679 | 24 21 44.1 | 6.225 |
| 6 | 15 14 38.92 | 2.0138 | 17 32 53.1 | 10.760 | 6 | 16 57 30.98 | 2.2731 | 24 27 53.9 | 6.103 |
| 7 | 15 16 39.90 | 2.0189 | 17 43 36.6 | 10.690 | 7 | 16 59 47.52 | 2.2781 | 24 33 56.3 | 5.978 |
| 8 | 15 18 41.19 | 2.0241 | 17 54 15.9 | 10.618 | 8 | 17 2 4.35 | 2.2830 | 24 39 51.3 | 5.853 |
| 9 | 15 20 42.79 | 2.0292 | 18 4 50.8 | 10.545 | 9 | 17 4 21.48 | 2.2880 | 24 45 38.7 | 5.727 |
| 10 | 15 22 44.70 | 2.0344 | 18 15 21.3 | 10.471 | 10 | 17 6 38.91 | 2.2930 | 24 51 18.5 | 5.600 |
| 11 | 15 24 46.92 | 2.0397 | 18 25 47.3 | 10.396 | 11 | 17 8 56.64 | 2.2979 | 24 56 50.7 | 5.473 |
| 12 | 15 26 49.46 | 2.0449 | 18 36 8.8 | 10.320 | 12 | 17 11 14.66 | 2.3027 | 25 2 15.2 | 5.343 |
| 13 | 15 28 52.31 | 2.0502 | 18 46 25.7 | 10.242 | 13 | 17 13 32.97 | 2.3076 | 25 7 31.9 | 5.213 |
| 14 | 15 30 55.48 | 2.0555 | 18 56 37.9 | 10.163 | 14 | 17 15 51.57 | 2.3124 | 25 12 40.8 | 5.082 |
| 15 | 15 32 58.97 | 2.0608 | 19 6 45.3 | 10.083 | 15 | 17 18 10.46 | 2.3172 | 25 17 41.8 | 4.950 |
| 16 | 15 35 2.78 | 2.0662 | 19 16 47.9 | 10.002 | 16 | 17 20 29.63 | 2.3218 | 25 22 34.8 | 4.817 |
| 17 | 15 37 6.91 | 2.0715 | 19 26 45.6 | 9.921 | 17 | 17 22 49.07 | 2.3264 | 25 27 19.8 | 4.683 |
| 18 | 15 39 11.36 | 2.0769 | 19 36 38.4 | 9.838 | 18 | 17 25 8.79 | 2.3309 | 25 31 56.8 | 4.549 |
| 19 | 15 41 16.14 | 2.0823 | 19 46 26.2 | 9.754 | 19 | 17 27 28.78 | 2.3353 | 25 36 25.7 | 4.413 |
| 20 | 15 43 21.24 | 2.0877 | 19 56 8.9 | 9.668 | 20 | 17 29 49.03 | 2.3398 | 25 40 46.4 | 4.277 |
| 21 | 15 45 26.67 | 2.0932 | 20 5 46.4 | 9.582 | 21 | 17 32 9.55 | 2.3442 | 25 44 58.9 | 4.139 |
| 22 | 15 47 32.43 | 2.0987 | 20 15 18.7 | 9.494 | 22 | 17 34 30.33 | 2.3484 | 25 49 3.1 | 4.001 |
| 23 | 15 49 38.52 | 2.1042 | 20 24 45.7 | 9.406 | 23 | 17 36 51.36 | 2.3525 | 25 52 59.0 | 3.862 |
| 24 | 15 51 44.93 | 2.1096 | S. 20 34 7.4 | 9.317 | 24 | 17 39 12.63 | 2.3566 | S. 25 56 46.5 | 3.722 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|---------------------|---------------|---------------------|-------------|------------------|---------------------|---------------|---------------------|
| THURSDAY 5. | | | | | SATURDAY 7. | | | | |
| 0 | 17 39 12.63 | 2.3566 | S. 25 56 46.5 | 3.792 | 0 | 19 35 24.33 | 2.4471 | S. 26 2 27.4 | 3.695 |
| 1 | 17 41 34.15 | 2.3607 | 26 0 25.6 | 3.581 | 1 | 19 37 51.14 | 2.4466 | 25 58 45.2 | 3.789 |
| 2 | 17 43 55.92 | 2.3647 | 26 3 56.2 | 3.439 | 2 | 19 40 17.92 | 2.4460 | 25 54 53.5 | 3.940 |
| 3 | 17 46 17.92 | 2.3686 | 26 7 18.3 | 3.297 | 3 | 19 42 44.66 | 2.4452 | 25 50 52.4 | 4.097 |
| 4 | 17 48 40.15 | 2.3724 | 26 10 31.8 | 3.154 | 4 | 19 45 11.35 | 2.4444 | 25 46 41.9 | 4.253 |
| 5 | 17 51 2.61 | 2.3769 | 26 13 36.7 | 3.010 | 5 | 19 47 37.99 | 2.4435 | 25 42 22.0 | 4.409 |
| 6 | 17 53 25.29 | 2.3798 | 26 16 33.0 | 2.866 | 6 | 19 50 4.57 | 2.4424 | 25 37 52.8 | 4.565 |
| 7 | 17 55 48.19 | 2.3824 | 26 19 20.6 | 2.790 | 7 | 19 52 31.08 | 2.4413 | 25 33 14.2 | 4.722 |
| 8 | 17 58 11.30 | 2.3868 | 26 21 59.4 | 2.574 | 8 | 19 54 57.53 | 2.4402 | 25 28 26.2 | 4.878 |
| 9 | 18 0 34.61 | 2.3909 | 26 24 29.4 | 2.497 | 9 | 19 57 23.91 | 2.4390 | 25 23 28.9 | 5.033 |
| 10 | 18 2 58.12 | 2.3936 | 26 26 50.6 | 2.279 | 10 | 19 59 50.21 | 2.4376 | 25 18 22.3 | 5.188 |
| 11 | 18 5 21.84 | 2.3969 | 26 29 2.9 | 2.131 | 11 | 20 2 16.42 | 2.4361 | 25 13 6.4 | 5.343 |
| 12 | 18 7 45.75 | 2.4000 | 26 31 6.3 | 1.982 | 12 | 20 4 42.54 | 2.4346 | 25 7 41.2 | 5.497 |
| 13 | 18 10 9.81 | 2.4030 | 26 33 0.8 | 1.833 | 13 | 20 7 8.57 | 2.4330 | 25 2 6.8 | 5.650 |
| 14 | 18 12 34.11 | 2.4060 | 26 34 46.3 | 1.683 | 14 | 20 9 34.50 | 2.4313 | 24 56 23.2 | 5.802 |
| 15 | 18 14 58.56 | 2.4089 | 26 36 22.7 | 1.533 | 15 | 20 12 0.33 | 2.4296 | 24 50 30.5 | 5.955 |
| 16 | 18 17 23.18 | 2.4117 | 26 37 50.1 | 1.381 | 16 | 20 14 26.05 | 2.4277 | 24 44 28.6 | 6.107 |
| 17 | 18 19 47.96 | 2.4143 | 26 39 8.4 | 1.229 | 17 | 20 16 51.66 | 2.4258 | 24 38 17.6 | 6.259 |
| 18 | 18 22 12.89 | 2.4169 | 26 40 17.6 | 1.077 | 18 | 20 19 17.15 | 2.4238 | 24 31 57.5 | 6.410 |
| 19 | 18 24 37.98 | 2.4194 | 26 41 17.6 | 0.924 | 19 | 20 21 42.52 | 2.4217 | 24 25 28.4 | 6.560 |
| 20 | 18 27 3.22 | 2.4217 | 26 42 8.4 | 0.771 | 20 | 20 24 7.76 | 2.4197 | 24 18 50.3 | 6.711 |
| 21 | 18 29 28.59 | 2.4239 | 26 42 50.1 | 0.617 | 21 | 20 26 32.88 | 2.4176 | 24 12 3.1 | 6.861 |
| 22 | 18 31 54.09 | 2.4261 | 26 43 22.5 | 0.463 | 22 | 20 28 57.87 | 2.4153 | 24 5 7.0 | 7.009 |
| 23 | 18 34 19.73 | 2.4283 | S. 26 43 45.7 | 0.309 | 23 | 20 31 22.72 | 2.4130 | S. 23 58 2.0 | 7.157 |
| FRIDAY 6. | | | | | SUNDAY 8. | | | | |
| 0 | 18 36 45.49 | 2.4309 | S. 26 43 59.6 | - 0.154 | 0 | 20 33 47.43 | 2.4107 | S. 23 50 48.1 | 7.305 |
| 1 | 18 39 11.36 | 2.4321 | 26 44 4.2 | + 0.002 | 1 | 20 36 12.00 | 2.4089 | 23 43 25.4 | 7.459 |
| 2 | 18 41 37.34 | 2.4339 | 26 43 59.4 | 0.157 | 2 | 20 38 36.42 | 2.4067 | 23 35 53.9 | 7.596 |
| 3 | 18 44 3.43 | 2.4357 | 26 43 45.3 | 0.313 | 3 | 20 41 0.69 | 2.4039 | 23 28 13.6 | 7.744 |
| 4 | 18 46 29.62 | 2.4373 | 26 43 21.8 | 0.470 | 4 | 20 43 24.81 | 2.4007 | 23 20 24.6 | 7.888 |
| 5 | 18 48 55.90 | 2.4387 | 26 42 48.9 | 0.626 | 5 | 20 45 48.77 | 2.3980 | 23 12 27.0 | 8.031 |
| 6 | 18 51 22.26 | 2.4400 | 26 42 6.7 | 0.782 | 6 | 20 48 12.57 | 2.3963 | 23 4 20.9 | 8.174 |
| 7 | 18 53 48.70 | 2.4413 | 26 41 15.1 | 0.939 | 7 | 20 50 36.21 | 2.3936 | 22 56 6.2 | 8.317 |
| 8 | 18 56 15.22 | 2.4425 | 26 40 14.0 | 1.097 | 8 | 20 52 59.68 | 2.3898 | 22 47 42.9 | 8.459 |
| 9 | 18 58 41.80 | 2.4435 | 26 39 3.4 | 1.255 | 9 | 20 55 22.99 | 2.3871 | 22 39 11.1 | 8.600 |
| 10 | 19 1 8.44 | 2.4445 | 26 37 43.4 | 1.413 | 10 | 20 57 46.13 | 2.3843 | 22 30 30.9 | 8.740 |
| 11 | 19 3 35.14 | 2.4453 | 26 36 13.9 | 1.571 | 11 | 21 0 9.10 | 2.3813 | 22 21 42.3 | 8.878 |
| 12 | 19 6 1.88 | 2.4460 | 26 34 34.9 | 1.729 | 12 | 21 2 31.89 | 2.3783 | 22 12 45.5 | 9.016 |
| 13 | 19 8 28.66 | 2.4467 | 26 32 46.4 | 1.887 | 13 | 21 4 54.50 | 2.3754 | 22 3 40.4 | 9.154 |
| 14 | 19 10 55.48 | 2.4473 | 26 30 48.5 | 2.044 | 14 | 21 7 16.94 | 2.3725 | 21 54 27.0 | 9.291 |
| 15 | 19 13 22.34 | 2.4478 | 26 28 41.1 | 2.202 | 15 | 21 9 39.20 | 2.3695 | 21 45 5.5 | 9.426 |
| 16 | 19 15 49.22 | 2.4481 | 26 26 24.2 | 2.361 | 16 | 21 12 1.28 | 2.3664 | 21 35 35.9 | 9.560 |
| 17 | 19 18 16.11 | 2.4483 | 26 23 57.8 | 2.519 | 17 | 21 14 23.17 | 2.3633 | 21 25 58.3 | 9.693 |
| 18 | 19 20 43.01 | 2.4484 | 26 21 21.9 | 2.678 | 18 | 21 16 44.88 | 2.3602 | 21 16 12.7 | 9.826 |
| 19 | 19 23 9.92 | 2.4485 | 26 18 36.5 | 2.836 | 19 | 21 19 6.40 | 2.3572 | 21 6 19.2 | 9.958 |
| 20 | 19 25 36.83 | 2.4484 | 26 15 41.6 | 2.993 | 20 | 21 21 27.74 | 2.3541 | 20 56 17.8 | 10.089 |
| 21 | 19 28 3.73 | 2.4482 | 26 12 37.3 | 3.151 | 21 | 21 23 48.89 | 2.3509 | 20 46 8.5 | 10.219 |
| 22 | 19 30 30.62 | 2.4480 | 26 9 23.5 | 3.309 | 22 | 21 26 9.85 | 2.3478 | 20 35 51.5 | 10.348 |
| 23 | 19 32 57.49 | 2.4476 | 26 6 0.2 | 3.467 | 23 | 21 28 30.62 | 2.3447 | 20 25 26.8 | 10.476 |
| 24 | 19 35 24.33 | 2.4471 | S. 26 2 27.4 | 3.625 | 24 | 21 30 51.21 | 2.3415 | S. 20 14 54.4 | 10.603 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|--|---------------------|------------------|---------------------|---------------|--|---------------------|-----------------|---------------------|
| MONDAY 9. | | | | | WEDNESDAY 11. | | | | |
| 0 | ^h 21 ^m 30 ^s 51.21 | 2.3415 | S. 20° 14' 54.4" | 10.603 | 0 | ^h 23 ^m 19 ^s 49.81 | 2.9119 | S. 9° 42' 5.9" | 15.379 |
| 1 | 21 33 11.60 | 2.3383 | 20 4 14.5 | 10.798 | 1 | 23 22 2.47 | 2.9109 | 9 26 47.6 | 15.337 |
| 2 | 21 35 31.80 | 2.3351 | 19 53 27.1 | 10.853 | 2 | 23 24 15.04 | 2.9087 | 9 11 25.4 | 15.401 |
| 3 | 21 37 51.81 | 2.3319 | 19 42 32.2 | 10.977 | 3 | 23 26 27.52 | 2.9079 | 8 55 59.5 | 15.462 |
| 4 | 21 40 11.63 | 2.3287 | 19 31 29.9 | 11.099 | 4 | 23 28 39.91 | 2.9058 | 8 40 30.0 | 15.522 |
| 5 | 21 42 31.25 | 2.3254 | 19 20 20.3 | 11.220 | 5 | 23 30 52.22 | 2.9044 | 8 24 56.9 | 15.580 |
| 6 | 21 44 50.68 | 2.3222 | 19 9 3.5 | 11.340 | 6 | 23 33 4.44 | 2.9031 | 8 9 20.4 | 15.637 |
| 7 | 21 47 9.92 | 2.3191 | 18 57 39.5 | 11.459 | 7 | 23 35 16.59 | 2.9019 | 7 53 40.5 | 15.699 |
| 8 | 21 49 28.97 | 2.3159 | 18 46 8.4 | 11.577 | 8 | 23 37 28.67 | 2.9007 | 7 37 57.3 | 15.746 |
| 9 | 21 51 47.83 | 2.3128 | 18 34 30.2 | 11.695 | 9 | 23 39 40.67 | 2.1995 | 7 22 11.0 | 15.797 |
| 10 | 21 54 6.50 | 2.3096 | 18 22 45.0 | 11.811 | 10 | 23 41 52.61 | 2.1986 | 7 6 21.6 | 15.848 |
| 11 | 21 56 24.98 | 2.3064 | 18 10 52.9 | 11.925 | 11 | 23 44 4.50 | 2.1977 | 6 50 29.2 | 15.897 |
| 12 | 21 58 43.26 | 2.3032 | 17 58 54.0 | 12.038 | 12 | 23 46 16.33 | 2.1968 | 6 34 33.9 | 15.945 |
| 13 | 22 1 1.36 | 2.3001 | 17 46 48.3 | 12.151 | 13 | 23 48 28.11 | 2.1959 | 6 18 35.8 | 15.991 |
| 14 | 22 3 19.27 | 2.2970 | 17 34 35.9 | 12.262 | 14 | 23 50 39.84 | 2.1952 | 6 2 35.0 | 16.036 |
| 15 | 22 5 37.00 | 2.2939 | 17 22 16.8 | 12.372 | 15 | 23 52 51.53 | 2.1945 | 5 46 31.5 | 16.079 |
| 16 | 22 7 54.54 | 2.2908 | 17 9 51.2 | 12.481 | 16 | 23 55 3.18 | 2.1938 | 5 30 25.5 | 16.120 |
| 17 | 22 10 11.90 | 2.2877 | 16 57 19.1 | 12.588 | 17 | 23 57 14.79 | 2.1932 | 5 14 17.1 | 16.159 |
| 18 | 22 12 29.07 | 2.2847 | 16 44 40.6 | 12.695 | 18 | 23 59 26.37 | 2.1926 | 4 58 6.4 | 16.197 |
| 19 | 22 14 46.06 | 2.2817 | 16 31 55.7 | 12.800 | 19 | 0 1 37.93 | 2.1925 | 4 41 53.4 | 16.234 |
| 20 | 22 17 2.87 | 2.2787 | 16 19 4.6 | 12.903 | 20 | 0 3 49.47 | 2.1922 | 4 25 38.3 | 16.269 |
| 21 | 22 19 19.51 | 2.2758 | 16 6 7.3 | 13.006 | 21 | 0 6 0.99 | 2.1919 | 4 9 21.1 | 16.302 |
| 22 | 22 21 35.97 | 2.2729 | 15 53 3.9 | 13.107 | 22 | 0 8 12.50 | 2.1917 | 3 53 2.0 | 16.333 |
| 23 | 22 23 52.26 | 2.2700 | S. 15° 39' 54.4" | 13.207 | 23 | 0 10 24.00 | 2.1916 | S. 3° 36' 41.1" | 16.363 |
| TUESDAY 10. | | | | | THURSDAY 12. | | | | |
| 0 | 22 26 8.37 | 2.2671 | S. 15° 26' 39.0" | 13.306 | 0 | 0 12 35.49 | 2.1916 | S. 3° 20' 18.4" | 16.392 |
| 1 | 22 28 24.31 | 2.2643 | 15 13 17.7 | 13.403 | 1 | 0 14 46.99 | 2.1917 | 3 3 54.1 | 16.418 |
| 2 | 22 30 40.08 | 2.2615 | 14 59 50.6 | 13.500 | 2 | 0 16 58.49 | 2.1918 | 2 47 28.2 | 16.444 |
| 3 | 22 32 55.69 | 2.2587 | 14 46 17.7 | 13.596 | 3 | 0 19 10.00 | 2.1920 | 2 31 0.8 | 16.467 |
| 4 | 22 35 11.13 | 2.2560 | 14 32 39.1 | 13.689 | 4 | 0 21 21.53 | 2.1923 | 2 14 32.1 | 16.489 |
| 5 | 22 37 26.41 | 2.2534 | 14 18 55.0 | 13.781 | 5 | 0 23 33.08 | 2.1926 | 1 58 2.1 | 16.509 |
| 6 | 22 39 41.54 | 2.2508 | 14 5 5.4 | 13.872 | 6 | 0 25 44.64 | 2.1929 | 1 41 31.0 | 16.527 |
| 7 | 22 41 56.51 | 2.2482 | 13 51 10.4 | 13.962 | 7 | 0 27 56.23 | 2.1935 | 1 24 58.9 | 16.543 |
| 8 | 22 44 11.32 | 2.2456 | 13 37 10.0 | 14.050 | 8 | 0 30 7.86 | 2.1941 | 1 8 25.8 | 16.559 |
| 9 | 22 46 25.98 | 2.2431 | 13 23 4.4 | 14.136 | 9 | 0 32 19.52 | 2.1947 | 0 51 51.8 | 16.579 |
| 10 | 22 48 40.49 | 2.2407 | 13 8 53.7 | 14.222 | 10 | 0 34 31.22 | 2.1954 | 0 35 17.1 | 16.583 |
| 11 | 22 50 54.86 | 2.2383 | 12 54 37.8 | 14.307 | 11 | 0 36 42.97 | 2.1963 | 0 18 41.8 | 16.593 |
| 12 | 22 53 9.09 | 2.2360 | 12 40 16.9 | 14.389 | 12 | 0 38 54.78 | 2.1979 | S. 0° 2' 5.9" | 16.602 |
| 13 | 22 55 23.18 | 2.2337 | 12 25 51.1 | 14.471 | 13 | 0 41 6.64 | 2.1981 | N. 0° 14' 30.4" | 16.608 |
| 14 | 22 57 37.13 | 2.2314 | 12 11 20.4 | 14.551 | 14 | 0 43 18.55 | 2.1991 | 0 31 7.0 | 16.613 |
| 15 | 22 59 50.94 | 2.2292 | 11 56 45.0 | 14.629 | 15 | 0 45 30.53 | 2.2009 | 0 47 43.9 | 16.616 |
| 16 | 23 2 4.63 | 2.2271 | 11 42 4.9 | 14.707 | 16 | 0 47 42.58 | 2.2014 | 1 4 20.9 | 16.617 |
| 17 | 23 4 18.19 | 2.2249 | 11 27 20.2 | 14.782 | 17 | 0 49 54.70 | 2.2026 | 1 20 57.9 | 16.616 |
| 18 | 23 6 31.62 | 2.2228 | 11 12 31.0 | 14.857 | 18 | 0 52 6.89 | 2.2039 | 1 37 34.8 | 16.613 |
| 19 | 23 8 44.93 | 2.2209 | 10 57 37.4 | 14.930 | 19 | 0 54 19.17 | 2.2054 | 1 54 11.5 | 16.609 |
| 20 | 23 10 58.13 | 2.2190 | 10 42 39.4 | 15.002 | 20 | 0 56 31.54 | 2.2068 | 2 10 47.9 | 16.603 |
| 21 | 23 13 11.21 | 2.2171 | 10 27 37.2 | 15.072 | 21 | 0 58 43.99 | 2.2083 | 2 27 23.9 | 16.596 |
| 22 | 23 15 24.18 | 2.2153 | 10 12 30.8 | 15.141 | 22 | 1 0 56.54 | 2.2100 | 2 43 59.4 | 16.587 |
| 23 | 23 17 37.05 | 2.2136 | 9 57 20.3 | 15.207 | 23 | 1 3 9.19 | 2.2117 | 3 0 34.3 | 16.575 |
| 24 | 23 19 49.81 | 2.2119 | S. 9° 42' 5.9" | 15.272 | 24 | 1 5 21.95 | 2.2135 | N. 3° 17' 8.4" | 16.569 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|--|---------------------|---------------|---------------------|------------|---|---------------------|----------------|---------------------|
| FRIDAY 13. | | | | | SUNDAY 15. | | | | |
| 0 | ^h 1 ^m 5 ^s 21.95 | 2.9135 | N. 3 17' 8.4" | 16.569 | 0 | ^h 2 ^m 54 ^s 51.01 | 2.3677 | N. 15 42' 0.3" | 13.769 |
| 1 | 1 7 34.81 | 2.9153 | 3 33 41.7 | 16.547 | 1 | 2 57 13.20 | 2.3719 | 15 55 42.9 | 13.658 |
| 2 | 1 9 47.79 | 2.9179 | 3 50 14.0 | 16.530 | 2 | 2 59 35.64 | 2.3761 | 16 9 19.3 | 13.554 |
| 3 | 1 12 0.88 | 2.9199 | 4 6 45.3 | 16.519 | 3 | 3 1 58.33 | 2.3803 | 16 22 49.4 | 13.447 |
| 4 | 1 14 14.09 | 2.9212 | 4 23 15.4 | 16.491 | 4 | 3 4 21.27 | 2.3845 | 16 36 13.0 | 13.338 |
| 5 | 1 16 27.43 | 2.9233 | 4 39 44.2 | 16.469 | 5 | 3 6 44.47 | 2.3887 | 16 49 30.0 | 13.228 |
| 6 | 1 18 40.80 | 2.9255 | 4 56 11.7 | 16.446 | 6 | 3 9 7.91 | 2.3928 | 17 2 40.4 | 13.117 |
| 7 | 1 20 54.49 | 2.9278 | 5 12 37.7 | 16.419 | 7 | 3 11 31.60 | 2.3970 | 17 15 44.0 | 13.003 |
| 8 | 1 23 8.23 | 2.9301 | 5 29 2.0 | 16.391 | 8 | 3 13 55.55 | 2.4012 | 17 28 40.7 | 12.888 |
| 9 | 1 25 22.10 | 2.9324 | 5 45 24.6 | 16.362 | 9 | 3 16 19.75 | 2.4054 | 17 41 30.5 | 12.771 |
| 10 | 1 27 36.12 | 2.9349 | 6 1 45.4 | 16.331 | 10 | 3 18 44.20 | 2.4096 | 17 54 13.2 | 12.652 |
| 11 | 1 29 50.29 | 2.9375 | 6 18 4.3 | 16.297 | 11 | 3 21 8.90 | 2.4137 | 18 6 48.7 | 12.532 |
| 12 | 1 32 4.62 | 2.9401 | 6 34 21.1 | 16.262 | 12 | 3 23 33.84 | 2.4178 | 18 19 17.0 | 12.410 |
| 13 | 1 34 19.10 | 2.9427 | 6 50 35.8 | 16.226 | 13 | 3 25 59.03 | 2.4219 | 18 31 37.9 | 12.287 |
| 14 | 1 36 33.74 | 2.9454 | 7 6 48.2 | 16.187 | 14 | 3 28 24.47 | 2.4261 | 18 43 51.4 | 12.162 |
| 15 | 1 38 48.55 | 2.9482 | 7 22 58.2 | 16.146 | 15 | 3 30 50.16 | 2.4302 | 18 55 57.3 | 12.035 |
| 16 | 1 41 3.53 | 2.9511 | 7 39 5.7 | 16.103 | 16 | 3 33 16.09 | 2.4342 | 19 7 55.6 | 11.907 |
| 17 | 1 43 18.68 | 2.9540 | 7 55 10.6 | 16.059 | 17 | 3 35 42.26 | 2.4382 | 19 19 46.1 | 11.777 |
| 18 | 1 45 34.01 | 2.9570 | 8 11 12.8 | 16.013 | 18 | 3 38 8.67 | 2.4422 | 19 31 28.8 | 11.646 |
| 19 | 1 47 49.52 | 2.9600 | 8 27 12.2 | 15.965 | 19 | 3 40 35.32 | 2.4462 | 19 43 3.6 | 11.513 |
| 20 | 1 50 5.21 | 2.9631 | 8 43 8.6 | 15.915 | 20 | 3 43 2.21 | 2.4501 | 19 54 30.4 | 11.379 |
| 21 | 1 52 21.09 | 2.9662 | 8 59 2.0 | 15.863 | 21 | 3 45 29.33 | 2.4540 | 20 5 49.1 | 11.243 |
| 22 | 1 54 37.16 | 2.9694 | 9 14 52.2 | 15.809 | 22 | 3 47 56.69 | 2.4578 | 20 16 59.6 | 11.107 |
| 23 | 1 56 53.42 | 2.9727 | N. 9 30 39.1 | 15.754 | 23 | 3 50 24.27 | 2.4616 | N. 20 28 1.9 | 10.968 |
| SATURDAY 14. | | | | | MONDAY 16. | | | | |
| 0 | 1 59 9.88 | 2.9760 | N. 9 46 22.7 | 15.697 | 0 | 3 52 52.08 | 2.4653 | N. 20 38 55.8 | 10.828 |
| 1 | 2 1 26.54 | 2.9793 | 10 2 2.8 | 15.637 | 1 | 3 55 20.11 | 2.4691 | 20 49 41.2 | 10.687 |
| 2 | 2 3 43.40 | 2.9827 | 10 17 39.2 | 15.576 | 2 | 3 57 48.37 | 2.4728 | 21 0 18.2 | 10.545 |
| 3 | 2 6 0.47 | 2.9862 | 10 33 11.9 | 15.513 | 3 | 4 0 16.85 | 2.4764 | 21 10 46.6 | 10.401 |
| 4 | 2 8 17.75 | 2.9897 | 10 48 40.8 | 15.448 | 4 | 4 2 45.54 | 2.4799 | 21 21 6.3 | 10.256 |
| 5 | 2 10 35.24 | 2.9932 | 11 4 5.7 | 15.381 | 5 | 4 5 14.44 | 2.4835 | 21 31 17.3 | 10.109 |
| 6 | 2 12 52.94 | 2.9968 | 11 19 26.5 | 15.312 | 6 | 4 7 43.56 | 2.4870 | 21 41 19.4 | 9.961 |
| 7 | 2 15 10.86 | 2.3005 | 11 34 43.1 | 15.242 | 7 | 4 10 12.88 | 2.4903 | 21 51 12.6 | 9.812 |
| 8 | 2 17 29.00 | 2.3042 | 11 49 55.5 | 15.170 | 8 | 4 12 42.39 | 2.4935 | 22 0 56.9 | 9.662 |
| 9 | 2 19 47.37 | 2.3080 | 12 5 3.5 | 15.096 | 9 | 4 15 12.10 | 2.4968 | 22 10 32.1 | 9.511 |
| 10 | 2 22 5.96 | 2.3118 | 12 20 7.0 | 15.020 | 10 | 4 17 42.01 | 2.5000 | 22 19 58.2 | 9.358 |
| 11 | 2 24 24.78 | 2.3156 | 12 35 5.9 | 14.942 | 11 | 4 20 12.10 | 2.5030 | 22 29 15.1 | 9.205 |
| 12 | 2 26 43.83 | 2.3194 | 12 50 0.0 | 14.862 | 12 | 4 22 42.37 | 2.5060 | 22 38 22.8 | 9.051 |
| 13 | 2 29 3.11 | 2.3233 | 13 4 49.3 | 14.780 | 13 | 4 25 12.82 | 2.5089 | 22 47 21.2 | 8.895 |
| 14 | 2 31 22.61 | 2.3272 | 13 19 33.6 | 14.697 | 14 | 4 27 43.44 | 2.5118 | 22 56 10.2 | 8.737 |
| 15 | 2 33 42.38 | 2.3312 | 13 34 12.9 | 14.612 | 15 | 4 30 14.24 | 2.5147 | 23 4 49.7 | 8.579 |
| 16 | 2 36 2.37 | 2.3352 | 13 48 47.0 | 14.524 | 16 | 4 32 45.20 | 2.5173 | 23 13 19.7 | 8.421 |
| 17 | 2 38 22.60 | 2.3391 | 14 3 15.8 | 14.435 | 17 | 4 35 16.32 | 2.5199 | 23 21 40.2 | 8.263 |
| 18 | 2 40 43.06 | 2.3431 | 14 17 39.2 | 14.344 | 18 | 4 37 47.59 | 2.5224 | 23 29 51.2 | 8.103 |
| 19 | 2 43 3.77 | 2.3472 | 14 31 57.1 | 14.252 | 19 | 4 40 19.01 | 2.5248 | 23 37 52.5 | 7.941 |
| 20 | 2 45 24.73 | 2.3513 | 14 46 9.4 | 14.157 | 20 | 4 42 50.57 | 2.5271 | 23 45 44.1 | 7.778 |
| 21 | 2 47 45.13 | 2.3554 | 15 0 16.0 | 14.061 | 21 | 4 45 22.26 | 2.5292 | 23 53 25.8 | 7.614 |
| 22 | 2 50 7.38 | 2.3595 | 15 14 16.7 | 13.962 | 22 | 4 47 54.08 | 2.5313 | 24 0 57.7 | 7.450 |
| 23 | 2 52 29.07 | 2.3636 | 15 28 11.5 | 13.863 | 23 | 4 50 26.02 | 2.5334 | 24 8 19.8 | 7.286 |
| 24 | 2 54 51.01 | 2.3677 | N. 15 42 0.3 | 13.762 | 24 | 4 52 58.09 | 2.5354 | N. 24 15 32.1 | 7.122 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|------------------|---------------------|---------------|---------------------|--------------|------------------|---------------------|---------------|---------------------|
| TUESDAY 17. | | | | | THURSDAY 19. | | | | |
| 0 | 4 52 58.09 | 2.5354 | N.24 15' 32.1 | 7.192 | 0 | 6 54 32.49 | 2.4813 | N.26 41' 19.1 | 1.001 |
| 1 | 4 55 30.27 | 2.5372 | 24 22 34.4 | 6.955 | 1 | 6 57 1.25 | 2.4772 | 26 40 14.2 | 1.161 |
| 2 | 4 58 2.55 | 2.5388 | 24 29 26.7 | 6.788 | 2 | 6 59 29.75 | 2.4738 | 26 38 59.8 | 1.319 |
| 3 | 5 0 34.92 | 2.5403 | 24 36 8.9 | 6.620 | 3 | 7 1 57.09 | 2.4684 | 26 37 35.9 | 1.477 |
| 4 | 5 3 7.38 | 2.5418 | 24 42 41.1 | 6.453 | 4 | 7 4 25.96 | 2.4640 | 26 36 2.5 | 1.635 |
| 5 | 5 5 39.93 | 2.5432 | 24 49 3.3 | 6.285 | 5 | 7 6 53.67 | 2.4595 | 26 34 19.7 | 1.792 |
| 6 | 5 8 12.56 | 2.5444 | 24 55 15.3 | 6.115 | 6 | 7 9 21.10 | 2.4548 | 26 32 27.5 | 1.947 |
| 7 | 5 10 45.26 | 2.5455 | 25 1 17.1 | 5.946 | 7 | 7 11 48.25 | 2.4501 | 26 30 26.0 | 2.102 |
| 8 | 5 13 18.02 | 2.5465 | 25 7 8.8 | 5.776 | 8 | 7 14 15.11 | 2.4452 | 26 28 15.3 | 2.255 |
| 9 | 5 15 50.84 | 2.5474 | 25 12 50.3 | 5.606 | 9 | 7 16 41.67 | 2.4402 | 26 25 55.4 | 2.407 |
| 10 | 5 18 23.71 | 2.5482 | 25 18 21.5 | 5.435 | 10 | 7 19 7.93 | 2.4352 | 26 23 26.4 | 2.559 |
| 11 | 5 20 56.62 | 2.5488 | 25 23 42.5 | 5.265 | 11 | 7 21 33.89 | 2.4301 | 26 20 48.3 | 2.710 |
| 12 | 5 23 29.56 | 2.5493 | 25 28 53.3 | 5.094 | 12 | 7 23 59.54 | 2.4249 | 26 18 1.2 | 2.860 |
| 13 | 5 26 2.53 | 2.5497 | 25 33 53.8 | 4.922 | 13 | 7 26 24.88 | 2.4196 | 26 15 5.1 | 3.008 |
| 14 | 5 28 35.52 | 2.5499 | 25 38 43.9 | 4.749 | 14 | 7 28 49.89 | 2.4142 | 26 12 0.2 | 3.155 |
| 15 | 5 31 8.52 | 2.5500 | 25 43 23.7 | 4.577 | 15 | 7 31 14.58 | 2.4087 | 26 8 46.5 | 3.301 |
| 16 | 5 33 41.52 | 2.5500 | 25 47 53.2 | 4.405 | 16 | 7 33 38.94 | 2.4032 | 26 5 24.1 | 3.447 |
| 17 | 5 36 14.52 | 2.5499 | 25 52 12.3 | 4.232 | 17 | 7 36 2.97 | 2.3977 | 26 1 52.9 | 3.592 |
| 18 | 5 38 47.51 | 2.5497 | 25 56 21.1 | 4.060 | 18 | 7 38 26.66 | 2.3920 | 25 58 13.1 | 3.734 |
| 19 | 5 41 20.48 | 2.5493 | 26 0 19.5 | 3.888 | 19 | 7 40 50.01 | 2.3862 | 25 54 24.8 | 3.876 |
| 20 | 5 43 53.42 | 2.5487 | 26 4 7.6 | 3.716 | 20 | 7 43 13.01 | 2.3804 | 25 50 28.0 | 4.017 |
| 21 | 5 46 26.32 | 2.5480 | 26 7 45.4 | 3.543 | 21 | 7 45 35.66 | 2.3746 | 25 46 22.7 | 4.157 |
| 22 | 5 48 59.18 | 2.5479 | 26 11 12.8 | 3.370 | 22 | 7 47 57.96 | 2.3687 | 25 42 9.1 | 4.296 |
| 23 | 5 51 31.99 | 2.5469 | N.26 14 29.8 | 3.197 | 23 | 7 50 19.90 | 2.3628 | N.25 37 47.2 | 4.438 |
| WEDNESDAY 18. | | | | | FRIDAY 20. | | | | |
| 0 | 5 54 4.73 | 2.5459 | N.26 17 36.5 | 3.025 | 0 | 7 52 41.49 | 2.3568 | N.25 33 17.2 | 4.568 |
| 1 | 5 56 37.41 | 2.5441 | 26 20 32.8 | 2.853 | 1 | 7 55 2.72 | 2.3507 | 25 28 39.0 | 4.704 |
| 2 | 5 59 10.02 | 2.5428 | 26 23 18.8 | 2.681 | 2 | 7 57 23.57 | 2.3444 | 25 23 52.7 | 4.837 |
| 3 | 6 1 42.54 | 2.5413 | 26 25 54.5 | 2.508 | 3 | 7 59 44.05 | 2.3382 | 25 18 58.5 | 4.969 |
| 4 | 6 4 14.97 | 2.5397 | 26 28 19.8 | 2.337 | 4 | 8 2 4.16 | 2.3321 | 25 13 56.4 | 5.101 |
| 5 | 6 6 47.30 | 2.5379 | 26 30 34.9 | 2.166 | 5 | 8 4 23.90 | 2.3259 | 25 8 46.4 | 5.232 |
| 6 | 6 9 19.52 | 2.5360 | 26 32 39.7 | 1.994 | 6 | 8 6 43.27 | 2.3197 | 25 3 28.6 | 5.361 |
| 7 | 6 11 51.62 | 2.5341 | 26 34 34.2 | 1.823 | 7 | 8 9 2.26 | 2.3133 | 24 58 3.1 | 5.488 |
| 8 | 6 14 23.61 | 2.5321 | 26 36 18.5 | 1.653 | 8 | 8 11 20.86 | 2.3069 | 24 52 30.0 | 5.614 |
| 9 | 6 16 55.47 | 2.5298 | 26 37 52.6 | 1.483 | 9 | 8 13 39.08 | 2.3005 | 24 46 49.4 | 5.739 |
| 10 | 6 19 27.19 | 2.5274 | 26 39 16.5 | 1.314 | 10 | 8 15 56.92 | 2.2941 | 24 41 1.3 | 5.864 |
| 11 | 6 21 58.76 | 2.5249 | 26 40 30.3 | 1.145 | 11 | 8 18 14.37 | 2.2877 | 24 35 5.7 | 5.987 |
| 12 | 6 24 30.18 | 2.5222 | 26 41 33.9 | 0.976 | 12 | 8 20 31.44 | 2.2812 | 24 29 2.8 | 6.109 |
| 13 | 6 27 1.43 | 2.5194 | 26 42 27.4 | 0.807 | 13 | 8 22 48.12 | 2.2747 | 24 22 52.6 | 6.229 |
| 14 | 6 29 32.51 | 2.5166 | 26 43 10.8 | 0.640 | 14 | 8 25 4.41 | 2.2682 | 24 16 35.3 | 6.348 |
| 15 | 6 32 3.42 | 2.5137 | 26 43 44.2 | 0.473 | 15 | 8 27 20.30 | 2.2616 | 24 10 10.9 | 6.466 |
| 16 | 6 34 34.15 | 2.5108 | 26 44 7.6 | 0.307 | 16 | 8 29 35.80 | 2.2551 | 24 3 39.4 | 6.582 |
| 17 | 6 37 4.69 | 2.5073 | 26 44 21.0 | + 0.141 | 17 | 8 31 50.91 | 2.2485 | 23 57 1.0 | 6.697 |
| 18 | 6 39 35.03 | 2.5039 | 26 44 24.5 | - 0.024 | 18 | 8 34 5.62 | 2.2419 | 23 50 15.7 | 6.812 |
| 19 | 6 42 5.16 | 2.5004 | 26 44 18.1 | 0.189 | 19 | 8 36 19.94 | 2.2354 | 23 43 23.5 | 6.926 |
| 20 | 6 44 35.08 | 2.4968 | 26 44 1.8 | 0.353 | 20 | 8 38 33.87 | 2.2288 | 23 36 21.6 | 7.037 |
| 21 | 6 47 4.78 | 2.4931 | 26 43 35.7 | 0.516 | 21 | 8 40 47.40 | 2.2223 | 23 29 19.1 | 7.147 |
| 22 | 6 49 34.25 | 2.4892 | 26 42 59.8 | 0.678 | 22 | 8 43 0.54 | 2.2157 | 23 22 7.0 | 7.257 |
| 23 | 6 52 3.49 | 2.4853 | 26 42 14.3 | 0.839 | 23 | 8 45 13.28 | 2.2090 | 23 14 48.3 | 7.365 |
| 24 | 6 54 32.49 | 2.4813 | N.26 41 19.1 | 1.001 | 24 | 8 47 25.62 | 2.2024 | N.23 7 23.2 | 7.472 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|-----------------|---------------------|-------------|------------------|---------------------|------------------|---------------------|
| SATURDAY 21. | | | | | MONDAY 23. | | | | |
| 0 | 8 47 25.62 | 2.9094 | N. 23° 7' 23.2" | 7.472 | 0 | 10 26 1.63 | 1.9216 | N. 15° 27' 35.1" | 11.576 |
| 1 | 8 49 37.57 | 2.1959 | 22 59 51.7 | 7.577 | 1 | 10 27 56.79 | 1.9170 | 15 16 16.9 | 11.531 |
| 2 | 8 51 49.13 | 2.1893 | 22 52 13.9 | 7.682 | 2 | 10 29 51.67 | 1.9124 | 15 4 55.4 | 11.386 |
| 3 | 8 54 0.29 | 2.1827 | 22 44 29.9 | 7.785 | 3 | 10 31 46.28 | 1.9079 | 14 53 30.6 | 11.439 |
| 4 | 8 56 11.06 | 2.1769 | 22 36 39.7 | 7.887 | 4 | 10 33 40.62 | 1.9035 | 14 42 2.7 | 11.491 |
| 5 | 8 58 21.44 | 2.1697 | 22 28 43.4 | 7.987 | 5 | 10 35 34.70 | 1.8992 | 14 30 31.7 | 11.542 |
| 6 | 9 0 31.42 | 2.1631 | 22 20 41.2 | 8.087 | 6 | 10 37 28.52 | 1.8949 | 14 18 57.7 | 11.592 |
| 7 | 9 2 41.01 | 2.1566 | 22 12 33.0 | 8.186 | 7 | 10 39 22.08 | 1.8906 | 14 7 20.7 | 11.643 |
| 8 | 9 4 50.21 | 2.1502 | 22 4 18.9 | 8.282 | 8 | 10 41 15.39 | 1.8863 | 13 55 40.7 | 11.691 |
| 9 | 9 6 59.03 | 2.1437 | 21 55 59.1 | 8.378 | 9 | 10 43 8.44 | 1.8820 | 13 43 57.8 | 11.739 |
| 10 | 9 9 7.46 | 2.1373 | 21 47 33.5 | 8.474 | 10 | 10 45 1.25 | 1.8778 | 13 32 12.0 | 11.786 |
| 11 | 9 11 15.50 | 2.1308 | 21 39 2.2 | 8.567 | 11 | 10 46 53.82 | 1.8742 | 13 20 23.5 | 11.832 |
| 12 | 9 13 23.16 | 2.1245 | 21 30 25.4 | 8.659 | 12 | 10 48 46.15 | 1.8709 | 13 8 32.2 | 11.877 |
| 13 | 9 15 30.44 | 2.1181 | 21 21 43.1 | 8.751 | 13 | 10 50 38.25 | 1.8664 | 12 56 38.2 | 11.922 |
| 14 | 9 17 37.33 | 2.1117 | 21 12 55.3 | 8.849 | 14 | 10 52 30.12 | 1.8626 | 12 44 41.6 | 11.966 |
| 15 | 9 19 43.84 | 2.1054 | 21 4 2.1 | 8.931 | 15 | 10 54 21.76 | 1.8588 | 12 32 42.3 | 12.010 |
| 16 | 9 21 49.97 | 2.0991 | 20 55 3.6 | 9.018 | 16 | 10 56 13.18 | 1.8559 | 12 20 40.4 | 12.052 |
| 17 | 9 23 55.73 | 2.0928 | 20 45 59.9 | 9.105 | 17 | 10 58 4.39 | 1.8516 | 12 8 36.0 | 12.093 |
| 18 | 9 26 1.11 | 2.0868 | 20 36 51.0 | 9.191 | 18 | 10 59 55.38 | 1.8481 | 11 56 29.2 | 12.134 |
| 19 | 9 28 6.12 | 2.0804 | 20 27 37.0 | 9.276 | 19 | 11 1 46.16 | 1.8447 | 11 44 19.9 | 12.175 |
| 20 | 9 30 10.76 | 2.0743 | 20 18 17.9 | 9.359 | 20 | 11 3 36.74 | 1.8413 | 11 32 8.2 | 12.214 |
| 21 | 9 32 15.04 | 2.0682 | 20 8 53.9 | 9.441 | 21 | 11 5 27.12 | 1.8381 | 11 19 54.2 | 12.252 |
| 22 | 9 34 18.95 | 2.0622 | 19 59 25.0 | 9.522 | 22 | 11 7 17.31 | 1.8348 | 11 7 37.9 | 12.290 |
| 23 | 9 36 22.50 | 2.0561 | N. 19 49 51.2 | 9.602 | 23 | 11 9 7.30 | 1.8316 | N. 10 55 19.4 | 12.327 |
| SUNDAY 22. | | | | | TUESDAY 24. | | | | |
| 0 | 9 38 25.68 | 2.0501 | N. 19 40 12.7 | 9.681 | 0 | 11 10 57.10 | 1.8285 | N. 10 42 58.6 | 12.364 |
| 1 | 9 40 28.51 | 2.0442 | 19 30 29.5 | 9.759 | 1 | 11 12 46.72 | 1.8265 | 10 30 35.7 | 12.399 |
| 2 | 9 42 30.98 | 2.0383 | 19 20 41.6 | 9.837 | 2 | 11 14 36.16 | 1.8225 | 10 18 10.7 | 12.435 |
| 3 | 9 44 33.10 | 2.0324 | 19 10 49.1 | 9.913 | 3 | 11 16 25.42 | 1.8196 | 10 5 43.5 | 12.470 |
| 4 | 9 46 34.87 | 2.0266 | 19 0 52.1 | 9.988 | 4 | 11 18 14.51 | 1.8168 | 9 53 14.3 | 12.503 |
| 5 | 9 48 36.30 | 2.0209 | 18 50 50.6 | 10.062 | 5 | 11 20 3.43 | 1.8140 | 9 40 43.2 | 12.535 |
| 6 | 9 50 37.38 | 2.0159 | 18 40 44.7 | 10.134 | 6 | 11 21 52.19 | 1.8113 | 9 28 10.1 | 12.567 |
| 7 | 9 52 38.12 | 2.0096 | 18 30 34.5 | 10.206 | 7 | 11 23 40.79 | 1.8087 | 9 15 35.1 | 12.599 |
| 8 | 9 54 38.52 | 2.0039 | 18 20 20.0 | 10.277 | 8 | 11 25 29.24 | 1.8062 | 9 2 58.2 | 12.630 |
| 9 | 9 56 38.59 | 1.9984 | 18 10 1.3 | 10.347 | 9 | 11 27 17.53 | 1.8037 | 8 50 19.5 | 12.660 |
| 10 | 9 58 38.33 | 1.9929 | 17 59 38.4 | 10.415 | 10 | 11 29 5.68 | 1.8013 | 8 37 39.0 | 12.689 |
| 11 | 10 0 37.74 | 1.9874 | 17 49 11.5 | 10.482 | 11 | 11 30 53.69 | 1.7990 | 8 24 56.8 | 12.718 |
| 12 | 10 2 36.82 | 1.9820 | 17 38 40.6 | 10.549 | 12 | 11 32 41.56 | 1.7967 | 8 12 12.9 | 12.746 |
| 13 | 10 4 35.58 | 1.9766 | 17 28 5.7 | 10.615 | 13 | 11 34 29.29 | 1.7945 | 7 59 27.3 | 12.773 |
| 14 | 10 6 34.02 | 1.9713 | 17 17 26.8 | 10.680 | 14 | 11 36 16.90 | 1.7924 | 7 46 40.1 | 12.800 |
| 15 | 10 8 32.14 | 1.9661 | 17 6 44.1 | 10.744 | 15 | 11 38 4.38 | 1.7903 | 7 33 51.3 | 12.826 |
| 16 | 10 10 29.95 | 1.9610 | 16 55 57.6 | 10.807 | 16 | 11 39 51.74 | 1.7884 | 7 21 1.0 | 12.851 |
| 17 | 10 12 27.46 | 1.9559 | 16 45 7.3 | 10.869 | 17 | 11 41 38.99 | 1.7865 | 7 8 9.2 | 12.876 |
| 18 | 10 14 24.66 | 1.9508 | 16 34 13.3 | 10.930 | 18 | 11 43 26.12 | 1.7847 | 6 55 15.9 | 12.900 |
| 19 | 10 16 21.56 | 1.9456 | 16 23 15.7 | 10.990 | 19 | 11 45 13.15 | 1.7829 | 6 42 21.2 | 12.923 |
| 20 | 10 18 18.16 | 1.9406 | 16 12 14.5 | 11.049 | 20 | 11 47 0.07 | 1.7812 | 6 29 25.2 | 12.945 |
| 21 | 10 20 14.46 | 1.9359 | 16 1 9.8 | 11.107 | 21 | 11 48 46.89 | 1.7795 | 6 16 27.8 | 12.967 |
| 22 | 10 22 10.47 | 1.9311 | 15 50 1.6 | 11.165 | 22 | 11 50 33.61 | 1.7780 | 6 3 29.1 | 12.989 |
| 23 | 10 24 6.19 | 1.9263 | 15 38 50.0 | 11.221 | 23 | 11 52 20.25 | 1.7766 | 5 50 29.1 | 13.010 |
| 24 | 10 26 1.63 | 1.9216 | N. 15 27 35.1 | 11.276 | 24 | 11 54 6.80 | 1.7752 | N. 5 37 27.9 | 13.030 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|------------------|---------------------|----------------|---------------------|--------------|------------------|---------------------|----------------|---------------------|
| WEDNESDAY 25. | | | | | FRIDAY 27. | | | | |
| 0 | 11 54 6.80 | 1.7752 | N. 5 37' 27.9" | 13.030 | 0 | 13 19 2.54 | 1.7907 | S. 4 58' 46.8" | 13.296 |
| 1 | 11 55 53.27 | 1.7738 | 5 24 25.5 | 13.049 | 1 | 13 20 50.04 | 1.7927 | 5 12 0.0 | 13.213 |
| 2 | 11 57 39.66 | 1.7725 | 5 11 22.0 | 13.068 | 2 | 13 22 37.67 | 1.7948 | 5 25 12.4 | 13.200 |
| 3 | 11 59 25.97 | 1.7712 | 4 58 17.4 | 13.086 | 3 | 13 24 25.42 | 1.7970 | 5 38 24.0 | 13.186 |
| 4 | 12 1 12.21 | 1.7702 | 4 45 11.7 | 13.104 | 4 | 13 26 13.31 | 1.7992 | 5 51 34.7 | 13.171 |
| 5 | 12 2 58.39 | 1.7692 | 4 32 5.0 | 13.121 | 5 | 13 28 1.33 | 1.8015 | 6 4 44.5 | 13.155 |
| 6 | 12 4 44.51 | 1.7682 | 4 18 57.2 | 13.137 | 6 | 13 29 49.49 | 1.8038 | 6 17 53.3 | 13.139 |
| 7 | 12 6 30.57 | 1.7673 | 4 5 48.5 | 13.152 | 7 | 13 31 37.79 | 1.8063 | 6 31 1.1 | 13.122 |
| 8 | 12 8 16.58 | 1.7664 | 3 52 38.9 | 13.167 | 8 | 13 33 26.25 | 1.8089 | 6 44 7.9 | 13.104 |
| 9 | 12 10 2.54 | 1.7656 | 3 39 28.5 | 13.181 | 9 | 13 35 14.86 | 1.8115 | 6 57 13.6 | 13.085 |
| 10 | 12 11 48.45 | 1.7649 | 3 26 17.2 | 13.195 | 10 | 13 37 3.63 | 1.8141 | 7 10 18.1 | 13.065 |
| 11 | 12 13 34.33 | 1.7643 | 3 13 5.1 | 13.208 | 11 | 13 38 52.56 | 1.8168 | 7 23 21.4 | 13.045 |
| 12 | 12 15 20.17 | 1.7637 | 2 59 52.3 | 13.220 | 12 | 13 40 41.65 | 1.8196 | 7 36 23.5 | 13.024 |
| 13 | 12 17 5.98 | 1.7632 | 2 46 38.7 | 13.232 | 13 | 13 42 30.91 | 1.8225 | 7 49 24.3 | 13.002 |
| 14 | 12 18 51.76 | 1.7628 | 2 33 24.5 | 13.243 | 14 | 13 44 20.35 | 1.8254 | 8 2 23.7 | 12.979 |
| 15 | 12 20 37.52 | 1.7625 | 2 20 9.6 | 13.253 | 15 | 13 46 9.96 | 1.8283 | 8 15 21.8 | 12.956 |
| 16 | 12 22 23.26 | 1.7622 | 2 6 54.1 | 13.263 | 16 | 13 47 59.75 | 1.8314 | 8 28 18.5 | 12.932 |
| 17 | 12 24 8.99 | 1.7620 | 1 53 38.0 | 13.273 | 17 | 13 49 49.73 | 1.8345 | 8 41 13.6 | 12.906 |
| 18 | 12 25 54.70 | 1.7618 | 1 40 21.4 | 13.281 | 18 | 13 51 39.89 | 1.8377 | 8 54 7.2 | 12.880 |
| 19 | 12 27 40.40 | 1.7617 | 1 27 4.3 | 13.288 | 19 | 13 53 30.25 | 1.8410 | 9 6 59.2 | 12.853 |
| 20 | 12 29 26.11 | 1.7619 | 1 13 46.8 | 13.296 | 20 | 13 55 20.81 | 1.8443 | 9 19 49.6 | 12.826 |
| 21 | 12 31 11.83 | 1.7621 | 1 0 28.8 | 13.303 | 21 | 13 57 11.57 | 1.8477 | 9 32 38.3 | 12.797 |
| 22 | 12 32 57.56 | 1.7622 | 0 47 10.4 | 13.309 | 22 | 13 59 2.53 | 1.8510 | 9 45 25.2 | 12.767 |
| 23 | 12 34 43.29 | 1.7623 | N. 0 33 51.7 | 13.314 | 23 | 14 0 53.69 | 1.8544 | S. 9 58 10.3 | 12.737 |
| THURSDAY 26. | | | | | SATURDAY 28. | | | | |
| 0 | 12 36 29.03 | 1.7625 | N. 0 20 32.8 | 13.318 | 0 | 14 2 45.06 | 1.8580 | S. 10 10 53.6 | 12.706 |
| 1 | 12 38 14.79 | 1.7629 | N. 0 7 13.6 | 13.329 | 1 | 14 4 36.65 | 1.8617 | 10 23 35.0 | 12.674 |
| 2 | 12 40 0.58 | 1.7634 | S. 0 6 5.8 | 13.336 | 2 | 14 6 28.46 | 1.8654 | 10 36 14.5 | 12.641 |
| 3 | 12 41 46.40 | 1.7639 | 0 19 25.5 | 13.339 | 3 | 14 8 20.50 | 1.8692 | 10 48 51.9 | 12.606 |
| 4 | 12 43 32.25 | 1.7645 | 0 32 45.3 | 13.339 | 4 | 14 10 12.76 | 1.8730 | 11 1 27.2 | 12.572 |
| 5 | 12 45 18.14 | 1.7652 | 0 46 5.1 | 13.331 | 5 | 14 12 5.26 | 1.8769 | 11 14 0.5 | 12.537 |
| 6 | 12 47 4.07 | 1.7659 | 0 59 25.0 | 13.322 | 6 | 14 13 57.99 | 1.8808 | 11 26 31.6 | 12.500 |
| 7 | 12 48 50.05 | 1.7666 | 1 12 44.9 | 13.322 | 7 | 14 15 50.96 | 1.8848 | 11 39 0.5 | 12.462 |
| 8 | 12 50 36.07 | 1.7674 | 1 26 4.8 | 13.322 | 8 | 14 17 44.17 | 1.8888 | 11 51 27.1 | 12.423 |
| 9 | 12 52 22.14 | 1.7683 | 1 39 24.7 | 13.320 | 9 | 14 19 37.62 | 1.8929 | 12 3 51.3 | 12.383 |
| 10 | 12 54 8.27 | 1.7694 | 1 52 44.4 | 13.328 | 10 | 14 21 31.32 | 1.8971 | 12 16 13.1 | 12.343 |
| 11 | 12 55 54.47 | 1.7705 | 2 6 4.0 | 13.325 | 11 | 14 23 25.28 | 1.9014 | 12 28 32.5 | 12.302 |
| 12 | 12 57 40.73 | 1.7716 | 2 19 23.4 | 13.322 | 12 | 14 25 19.49 | 1.9057 | 12 40 49.4 | 12.260 |
| 13 | 12 59 27.06 | 1.7728 | 2 32 42.6 | 13.317 | 13 | 14 27 13.96 | 1.9100 | 12 53 3.7 | 12.217 |
| 14 | 13 1 13.47 | 1.7741 | 2 46 1.5 | 13.312 | 14 | 14 29 8.69 | 1.9144 | 13 5 15.4 | 12.172 |
| 15 | 13 2 59.96 | 1.7755 | 2 59 20.1 | 13.307 | 15 | 14 31 3.69 | 1.9189 | 13 17 24.4 | 12.127 |
| 16 | 13 4 46.53 | 1.7768 | 3 12 38.3 | 13.301 | 16 | 14 32 58.96 | 1.9234 | 13 29 30.6 | 12.080 |
| 17 | 13 6 33.18 | 1.7782 | 3 25 56.2 | 13.295 | 17 | 14 34 54.50 | 1.9280 | 13 41 34.0 | 12.033 |
| 18 | 13 8 19.92 | 1.7796 | 3 39 13.7 | 13.287 | 18 | 14 36 50.32 | 1.9326 | 13 53 34.6 | 11.986 |
| 19 | 13 10 6.76 | 1.7815 | 3 52 30.7 | 13.278 | 19 | 14 38 46.42 | 1.9373 | 14 5 32.3 | 11.936 |
| 20 | 13 11 53.70 | 1.7833 | 4 5 47.1 | 13.269 | 20 | 14 40 42.80 | 1.9421 | 14 17 26.9 | 11.884 |
| 21 | 13 13 40.74 | 1.7849 | 4 19 3.0 | 13.260 | 21 | 14 42 39.47 | 1.9469 | 14 29 18.4 | 11.833 |
| 22 | 13 15 27.89 | 1.7868 | 4 32 18.3 | 13.249 | 22 | 14 44 36.43 | 1.9518 | 14 41 6.8 | 11.781 |
| 23 | 13 17 15.16 | 1.7887 | 4 45 32.9 | 13.238 | 23 | 14 46 33.68 | 1.9567 | 14 52 52.1 | 11.728 |
| 24 | 13 19 2.54 | 1.7907 | S. 4 58 46.8 | 13.226 | 24 | 14 48 31.23 | 1.9616 | S. 15 4 34.2 | 11.674 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|------------|------------------|---------------------|----------------|---------------------|------------------------|------------------|---------------------|----------------|---------------------|
| SUNDAY 29. | | | | | TUESDAY, DECEMBER 1. | | | | |
| 0 | 14 48 31.23 | 1.9616 | S. 15° 4' 34.2 | 11.674 | 0 | 16 29 5.53 | 2.9368 | S. 23° 0' 23.1 | 7.692 |
| 1 | 14 50 29.07 | 1.9666 | 15 16 13.0 | 11.618 | | | | | |
| 2 | 14 52 27.22 | 1.9717 | 15 27 48.4 | 11.561 | | | | | |
| 3 | 14 54 25.67 | 1.9768 | 15 39 20.3 | 11.503 | | | | | |
| 4 | 14 56 24.43 | 1.9819 | 15 50 48.7 | 11.444 | | | | | |
| 5 | 14 58 23.50 | 1.9871 | 16 2 13.6 | 11.384 | | | | | |
| 6 | 15 0 22.88 | 1.9923 | 16 13 34.8 | 11.323 | | | | | |
| 7 | 15 2 22.58 | 1.9976 | 16 24 52.3 | 11.261 | | | | | |
| 8 | 15 4 22.60 | 2.0029 | 16 36 6.1 | 11.198 | | | | | |
| 9 | 15 6 22.93 | 2.0083 | 16 47 16.1 | 11.134 | | | | | |
| 10 | 15 8 23.59 | 2.0137 | 16 58 22.2 | 11.068 | | | | | |
| 11 | 15 10 24.57 | 2.0191 | 17 9 24.3 | 11.001 | | | | | |
| 12 | 15 12 25.88 | 2.0246 | 17 20 22.3 | 10.933 | | | | | |
| 13 | 15 14 27.52 | 2.0302 | 17 31 16.2 | 10.864 | | | | | |
| 14 | 15 16 29.50 | 2.0357 | 17 42 6.0 | 10.795 | | | | | |
| 15 | 15 18 31.81 | 2.0413 | 17 52 51.6 | 10.724 | | | | | |
| 16 | 15 20 34.46 | 2.0470 | 18 3 32.9 | 10.651 | | | | | |
| 17 | 15 22 37.45 | 2.0526 | 18 14 9.7 | 10.576 | | | | | |
| 18 | 15 24 40.78 | 2.0583 | 18 24 42.0 | 10.501 | | | | | |
| 19 | 15 26 44.45 | 2.0641 | 18 35 9.8 | 10.426 | | | | | |
| 20 | 15 28 48.47 | 2.0699 | 18 45 33.1 | 10.349 | | | | | |
| 21 | 15 30 52.84 | 2.0757 | 18 55 51.7 | 10.270 | | | | | |
| 22 | 15 32 57.56 | 2.0815 | 19 6 5.5 | 10.191 | | | | | |
| 23 | 15 35 2.62 | 2.0873 | S. 19 16 14.6 | 10.111 | | | | | |
| MONDAY 30. | | | | | PHASES OF THE MOON. | | | | |
| 0 | 15 37 8.03 | 2.0932 | S. 19 26 18.8 | 10.028 | ● New Moon . . Nov. | d | h | m | |
| 1 | 15 39 13.80 | 2.0991 | 19 36 18.0 | 9.945 | ☾ First Quarter . . . | 1 | 6 | 32.6 | |
| 2 | 15 41 19.92 | 2.1050 | 19 46 12.2 | 9.861 | ○ Full Moon | 8 | 20 | 46.4 | |
| 3 | 15 43 26.40 | 2.1109 | 19 56 1.3 | 9.775 | ○ Full Moon | 15 | 12 | 16.1 | |
| 4 | 15 45 33.23 | 2.1168 | 20 5 45.2 | 9.688 | ☾ Last Quarter | 22 | 20 | 25.9 | |
| 5 | 15 47 40.42 | 2.1228 | 20 15 23.8 | 9.600 | ● New Moon | 30 | 23 | 45.0 | |
| 6 | 15 49 47.97 | 2.1286 | 20 24 57.2 | 9.512 | | | | | |
| 7 | 15 51 55.88 | 2.1346 | 20 34 25.2 | 9.421 | | | | | |
| 8 | 15 54 4.15 | 2.1407 | 20 43 47.7 | 9.328 | | | | | |
| 9 | 15 56 12.77 | 2.1467 | 20 53 4.6 | 9.235 | | | | | |
| 10 | 15 58 21.76 | 2.1528 | 21 2 15.9 | 9.142 | | | | | |
| 11 | 16 0 31.11 | 2.1588 | 21 11 21.6 | 9.047 | ☾ Perigee. . . . Nov. | d | h | | |
| 12 | 16 2 40.82 | 2.1648 | 21 20 21.5 | 8.950 | ☾ Apogee. | 13 | 13.2 | | |
| 13 | 16 4 50.89 | 2.1709 | 21 29 15.6 | 8.852 | | 25 | 8.8 | | |
| 14 | 16 7 1.33 | 2.1770 | 21 38 3.7 | 8.752 | | | | | |
| 15 | 16 9 12.13 | 2.1830 | 21 46 45.8 | 8.652 | | | | | |
| 16 | 16 11 23.29 | 2.1890 | 21 55 21.9 | 8.550 | | | | | |
| 17 | 16 13 34.81 | 2.1950 | 22 3 51.8 | 8.447 | | | | | |
| 18 | 16 15 46.69 | 2.2010 | 22 12 15.5 | 8.342 | | | | | |
| 19 | 16 17 58.93 | 2.2070 | 22 20 32.9 | 8.237 | | | | | |
| 20 | 16 20 11.53 | 2.2131 | 22 28 44.0 | 8.131 | | | | | |
| 21 | 16 22 24.50 | 2.2191 | 22 36 48.6 | 8.023 | | | | | |
| 22 | 16 24 37.82 | 2.2250 | 22 44 46.7 | 7.913 | | | | | |
| 23 | 16 26 51.50 | 2.2309 | 22 52 38.2 | 7.803 | | | | | |
| 24 | 16 29 5.53 | 2.2368 | S. 23 0 23.1 | 7.692 | | | | | |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
| 2 | Sun W. | 8 8 56 | 3348 | 9 32 12 | 3326 | 10 55 53 | 3308 | 12 19 55 | 3292 |
| | α Aquilæ E. | 74 16 23 | 3816 | 73 1 37 | 3824 | 71 47 0 | 3833 | 70 32 32 | 3845 |
| | Fomalhaut E. | 103 43 3 | 3093 | 102 14 45 | 3083 | 100 46 15 | 3074 | 99 17 34 | 3066 |
| 3 | Sun W. | 19 24 10 | 3233 | 20 49 40 | 3223 | 22 15 22 | 3214 | 23 41 15 | 3204 |
| | α Aquilæ E. | 64 23 37 | 3225 | 63 10 43 | 3248 | 61 58 12 | 3273 | 60 46 6 | 4002 |
| | Fomalhaut E. | 91 51 35 | 3096 | 90 21 54 | 3018 | 88 52 3 | 3010 | 87 22 3 | 3002 |
| | α Pegasi E. | 110 37 3 | 3319 | 109 13 5 | 3225 | 107 48 48 | 3220 | 106 24 13 | 3225 |
| 4 | Sun W. | 30 53 30 | 3158 | 32 20 30 | 3148 | 33 47 42 | 3138 | 35 15 5 | 3129 |
| | α Aquilæ E. | 54 53 28 | 4191 | 53 44 53 | 4241 | 52 37 6 | 4297 | 51 30 11 | 4358 |
| | Fomalhaut E. | 79 49 48 | 3229 | 78 18 56 | 2962 | 76 47 56 | 2957 | 75 16 49 | 2950 |
| | α Pegasi E. | 99 17 13 | 3201 | 97 51 5 | 3189 | 96 24 43 | 3178 | 94 58 8 | 3168 |
| 5 | Sun W. | 42 34 55 | 3081 | 44 3 28 | 3070 | 45 32 14 | 3061 | 47 1 11 | 3051 |
| | Antares W. | 17 9 38 | 2808 | 18 43 56 | 2788 | 20 18 40 | 2769 | 21 53 49 | 2751 |
| | Fomalhaut E. | 67 39 30 | 2927 | 66 7 45 | 2922 | 64 35 54 | 2919 | 63 3 59 | 2915 |
| | JUPITER E. | 72 46 43 | 2738 | 71 10 54 | 2727 | 69 34 53 | 2720 | 67 58 40 | 2712 |
| | α Pegasi E. | 87 42 20 | 3124 | 86 14 40 | 3116 | 84 46 50 | 3109 | 83 18 51 | 3103 |
| 6 | Sun W. | 54 29 9 | 2998 | 55 59 24 | 2987 | 57 29 53 | 2977 | 59 0 35 | 2965 |
| | Antares W. | 29 54 48 | 2680 | 31 31 55 | 2668 | 33 9 18 | 2655 | 34 46 58 | 2643 |
| | Fomalhaut E. | 55 23 37 | 2909 | 53 51 30 | 2910 | 52 19 24 | 2912 | 50 47 21 | 2916 |
| | JUPITER E. | 59 54 39 | 2666 | 58 17 14 | 2657 | 56 30 37 | 2648 | 55 1 47 | 2639 |
| | α Pegasi E. | 75 57 14 | 3078 | 74 28 38 | 3075 | 72 59 58 | 3073 | 71 31 15 | 3072 |
| 7 | Sun W. | 66 37 37 | 2909 | 68 9 45 | 2897 | 69 42 8 | 2885 | 71 14 46 | 2873 |
| | Antares W. | 42 59 22 | 2584 | 44 38 39 | 2572 | 46 18 13 | 2560 | 47 58 3 | 2548 |
| | Fomalhaut E. | 43 8 49 | 2958 | 41 37 43 | 2973 | 40 6 57 | 2992 | 38 36 34 | 3015 |
| | JUPITER E. | 46 49 25 | 2591 | 45 10 18 | 2581 | 43 30 57 | 2572 | 41 51 23 | 2561 |
| | α Pegasi E. | 64 7 35 | 3078 | 62 38 58 | 3082 | 61 10 27 | 3089 | 59 42 4 | 3096 |
| 8 | Sun W. | 79 1 52 | 2811 | 80 36 5 | 2798 | 82 10 35 | 2785 | 83 45 22 | 2773 |
| | Antares W. | 56 21 18 | 2489 | 58 2 47 | 2477 | 59 44 33 | 2465 | 61 26 36 | 2453 |
| | JUPITER E. | 33 30 17 | 2517 | 31 49 27 | 2509 | 30 8 26 | 2501 | 28 27 14 | 2493 |
| | α Pegasi E. | 52 23 17 | 3188 | 50 56 29 | 3190 | 49 30 8 | 3216 | 48 4 18 | 3246 |
| | α Arietis E. | 92 10 10 | 2569 | 90 30 33 | 2558 | 88 50 40 | 2546 | 87 10 31 | 2535 |
| 9 | Sun W. | 91 43 26 | 2709 | 93 19 54 | 2696 | 94 56 39 | 2683 | 96 33 42 | 2670 |
| | Antares W. | 70 1 9 | 2391 | 71 44 56 | 2380 | 73 29 0 | 2368 | 75 13 21 | 2355 |
| | α Arietis E. | 78 45 49 | 2479 | 77 4 6 | 2469 | 75 22 9 | 2458 | 73 39 57 | 2448 |
| | Aldebaran E. | 109 1 3 | 2415 | 107 17 49 | 2402 | 105 34 17 | 2389 | 103 50 27 | 2378 |
| 10 | Sun W. | 104 43 12 | 2607 | 106 21 57 | 2595 | 108 0 59 | 2583 | 109 40 17 | 2571 |
| | α Aquilæ W. | 46 28 47 | 4197 | 47 37 16 | 4077 | 48 47 40 | 3968 | 49 59 51 | 3868 |
| | α Arietis E. | 65 5 28 | 2403 | 63 21 57 | 2394 | 61 38 14 | 2387 | 59 54 21 | 2381 |
| | Aldebaran E. | 95 6 55 | 2317 | 93 21 20 | 2306 | 91 35 20 | 2294 | 89 49 21 | 2283 |
| 11 | Sun W. | 118 0 51 | 2515 | 119 41 44 | 2504 | 121 22 52 | 2493 | 123 4 15 | 2484 |
| | α Aquilæ W. | 56 23 55 | 3479 | 57 44 43 | 3419 | 59 6 38 | 3364 | 60 29 36 | 3312 |
| | α Arietis E. | 51 12 53 | 2359 | 49 28 19 | 2358 | 47 43 44 | 2359 | 45 59 10 | 2361 |
| | Aldebaran E. | 80 54 44 | 2222 | 79 7 4 | 2222 | 77 19 9 | 2213 | 75 31 1 | 2204 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|------------|----------------|-------------|----------------|-------------|----------------|
| 2 | SUN W. | 13° 44' 16" | 3978 | 15° 8' 53" | 3965 | 16° 33' 46" | 3963 | 17° 58' 52" | 3943 |
| | α Aquilæ E. | 69 18 16 | 3857 | 68 4 13 | 3871 | 66 50 24 | 3887 | 65 36 51 | 3906 |
| | Fomalhaut E. | 97 48 43 | 3057 | 96 19 41 | 3049 | 94 50 29 | 3041 | 93 21 7 | 3033 |
| 3 | SUN W. | 25 7 20 | 3194 | 26 33 36 | 3185 | 28 0 3 | 3176 | 29 26 41 | 3167 |
| | α Aquilæ E. | 59 34 28 | 4032 | 58 23 20 | 4066 | 57 12 45 | 4103 | 56 2 46 | 4145 |
| | Fomalhaut E. | 85 51 53 | 2996 | 84 21 35 | 2989 | 82 51 8 | 2981 | 81 20 32 | 2975 |
| | α Pegasi E. | 104 59 20 | 3251 | 103 34 11 | 3238 | 102 8 47 | 3225 | 100 43 7 | 3213 |
| 4 | SUN W. | 36 42 40 | 3119 | 38 10 26 | 3110 | 39 38 24 | 3100 | 41 6 34 | 3091 |
| | α Aquilæ E. | 50 24 12 | 4497 | 49 19 15 | 4501 | 48 15 24 | 4585 | 47 12 46 | 4677 |
| | Fomalhaut E. | 73 45 34 | 2945 | 72 14 12 | 2940 | 70 42 44 | 2935 | 69 11 10 | 2931 |
| | α Pegasi E. | 93 31 21 | 3158 | 92 4 22 | 3149 | 90 37 12 | 3140 | 89 9 51 | 3132 |
| 5 | SUN W. | 48 30 21 | 3040 | 49 59 44 | 3030 | 51 29 19 | 3020 | 52 59 7 | 3009 |
| | Antares W. | 23 29 21 | 2735 | 25 5 14 | 2730 | 26 41 27 | 2706 | 28 17 59 | 2693 |
| | Fomalhaut E. | 61 31 59 | 2912 | 59 59 56 | 2911 | 58 27 51 | 2909 | 56 55 44 | 2909 |
| | JUPITER E. | 66 22 16 | 2703 | 64 45 40 | 2694 | 63 8 52 | 2685 | 61 31 52 | 2675 |
| | α Pegasi E. | 81 50 45 | 3097 | 80 22 32 | 3091 | 78 54 12 | 3087 | 77 25 46 | 3082 |
| 6 | SUN W. | 60 31 31 | 2954 | 62 2 41 | 2943 | 63 34 5 | 2931 | 65 5 44 | 2920 |
| | Antares W. | 36 24 54 | 2631 | 38 3 7 | 2619 | 39 41 36 | 2607 | 41 20 21 | 2596 |
| | Fomalhaut E. | 49 15 22 | 2920 | 47 43 29 | 2927 | 46 11 45 | 2935 | 44 40 11 | 2945 |
| | JUPITER E. | 53 23 45 | 2629 | 51 45 30 | 2619 | 50 7 1 | 2610 | 48 28 19 | 2601 |
| | α Pegasi E. | 70 2 31 | 3071 | 68 33 46 | 3070 | 67 5 0 | 3072 | 65 36 16 | 3074 |
| 7 | SUN W. | 72 47 40 | 2861 | 74 20 49 | 2848 | 75 54 14 | 2836 | 77 27 55 | 2824 |
| | Antares W. | 49 38 9 | 2537 | 51 18 31 | 2525 | 52 59 10 | 2512 | 54 40 6 | 2501 |
| | Fomalhaut E. | 37 6 40 | 3043 | 35 37 20 | 3076 | 34 8 41 | 3116 | 32 40 51 | 3164 |
| | JUPITER E. | 40 11 35 | 2552 | 38 31 34 | 2543 | 36 51 21 | 2534 | 35 10 55 | 2525 |
| | α Pegasi E. | 58 13 50 | 3106 | 56 45 48 | 3118 | 55 18 0 | 3139 | 53 50 29 | 3148 |
| 8 | SUN W. | 85 20 25 | 2760 | 86 55 45 | 2747 | 88 31 22 | 2735 | 90 7 16 | 2722 |
| | Antares W. | 63 8 56 | 2441 | 64 51 33 | 2428 | 66 34 28 | 2416 | 68 17 40 | 2404 |
| | JUPITER E. | 26 45 51 | 2487 | 25 4 20 | 2469 | 23 22 42 | 2460 | 21 41 1 | 2450 |
| | α Pegasi E. | 46 39 3 | 2981 | 45 14 29 | 2992 | 43 50 43 | 2999 | 42 27 51 | 2493 |
| | α Arietis E. | 85 30 6 | 2523 | 83 49 25 | 2512 | 82 8 29 | 2501 | 80 27 17 | 2489 |
| 9 | SUN W. | 98 11 2 | 2657 | 99 48 39 | 2645 | 101 26 33 | 2632 | 103 4 44 | 2620 |
| | Antares W. | 76 58 0 | 2344 | 78 42 56 | 2331 | 80 28 10 | 2320 | 82 13 40 | 2308 |
| | α Arietis E. | 71 57 30 | 2438 | 70 14 49 | 2429 | 68 31 55 | 2419 | 66 48 48 | 2410 |
| | Aldebaran E. | 102 6 20 | 2365 | 100 21 55 | 2353 | 98 37 12 | 2341 | 96 52 12 | 2329 |
| 10 | SUN W. | 111 19 52 | 2559 | 112 59 43 | 2548 | 114 39 50 | 2536 | 116 20 13 | 2525 |
| | α Aquilæ W. | 51 13 43 | 3777 | 52 29 9 | 3803 | 53 46 3 | 3816 | 55 4 20 | 3845 |
| | α Arietis E. | 58 10 19 | 2375 | 56 26 8 | 2369 | 54 41 49 | 2364 | 52 57 23 | 2362 |
| | Aldebaran E. | 88 2 57 | 2272 | 86 16 17 | 2263 | 84 29 21 | 2251 | 82 42 10 | 2241 |
| 11 | SUN W. | 124 45 51 | 2474 | 126 27 41 | 2465 | 128 9 43 | 2457 | 129 51 57 | 2448 |
| | α Aquilæ W. | 61 53 34 | 3265 | 63 18 27 | 3221 | 64 44 11 | 3181 | 66 10 43 | 3144 |
| | α Arietis E. | 44 14 39 | 2364 | 42 30 13 | 2371 | 40 45 56 | 2379 | 39 1 51 | 2389 |
| | Aldebaran E. | 73 42 40 | 2196 | 71 54 7 | 2188 | 70 5 21 | 2181 | 68 16 25 | 2174 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
| 12 | α Aquilæ W. | 67 37 59 | 3111 | 69 5 55 | 3080 | 70 34 29 | 3052 | 72 3 37 | 3026 |
| | Fomalhaut W. | 32 58 37 | 2735 | 34 34 33 | 2675 | 36 11 47 | 2622 | 37 50 12 | 2575 |
| | JUPITER W. | 23 26 32 | 2199 | 25 15 1 | 2186 | 27 3 50 | 2174 | 28 52 57 | 2163 |
| | α Arietis E. | 37 18 1 | 2404 | 35 34 32 | 2423 | 33 51 30 | 2446 | 32 9 1 | 2475 |
| | Aldebaran E. | 66 27 18 | 2167 | 64 38 1 | 2162 | 62 48 36 | 2157 | 60 59 3 | 2151 |
| | Pollux E. | 110 29 46 | 2137 | 108 39 43 | 2130 | 106 49 30 | 2124 | 104 59 7 | 2118 |
| 13 | α Aquilæ W. | 79 36 11 | 2936 | 81 7 44 | 2925 | 82 39 31 | 2916 | 84 11 30 | 2909 |
| | Fomalhaut W. | 46 15 52 | 2417 | 47 59 2 | 2396 | 49 42 43 | 2378 | 51 26 50 | 2361 |
| | JUPITER W. | 38 2 0 | 2196 | 39 52 19 | 2122 | 41 42 45 | 2118 | 43 33 17 | 2115 |
| | α Pegasi W. | 33 3 24 | 2800 | 34 18 26 | 2829 | 35 36 18 | 2850 | 36 56 42 | 2879 |
| | Aldebaran E. | 51 49 51 | 2139 | 49 59 52 | 2139 | 48 9 52 | 2139 | 46 19 53 | 2141 |
| | Pollux E. | 95 45 9 | 2095 | 93 54 2 | 2092 | 92 2 51 | 2090 | 90 11 37 | 2088 |
| 14 | α Aquilæ W. | 91 52 49 | 2904 | 93 25 3 | 2909 | 94 57 11 | 2916 | 96 29 9 | 2926 |
| | Fomalhaut W. | 60 12 23 | 2309 | 61 58 10 | 2303 | 63 44 5 | 2299 | 65 30 6 | 2296 |
| | JUPITER W. | 52 46 40 | 2111 | 54 37 22 | 2113 | 56 28 1 | 2115 | 58 18 37 | 2118 |
| | α Pegasi W. | 44 8 1 | 2975 | 45 38 45 | 2923 | 47 10 35 | 2976 | 48 43 24 | 2936 |
| | Aldebaran E. | 37 11 13 | 2168 | 35 21 57 | 2178 | 33 32 56 | 2190 | 31 44 14 | 2204 |
| | Pollux E. | 80 55 4 | 2089 | 79 3 48 | 2091 | 77 12 35 | 2094 | 75 21 27 | 2098 |
| 15 | Fomalhaut W. | 74 20 37 | 2300 | 76 6 36 | 2305 | 77 52 28 | 2310 | 79 38 13 | 2316 |
| | JUPITER W. | 67 30 8 | 2143 | 69 20 1 | 2150 | 71 9 44 | 2157 | 72 59 16 | 2166 |
| | α Pegasi W. | 56 38 30 | 2703 | 58 15 6 | 2687 | 59 52 3 | 2675 | 61 29 17 | 2665 |
| | Pollux E. | 66 7 23 | 2194 | 64 17 1 | 2131 | 62 26 49 | 2139 | 60 36 49 | 2147 |
| | Regulus E. | 102 25 46 | 2136 | 100 35 41 | 2143 | 98 45 47 | 2150 | 96 56 4 | 2159 |
| 16 | Fomalhaut W. | 88 24 14 | 2362 | 90 8 44 | 2373 | 91 52 57 | 2386 | 93 36 52 | 2399 |
| | JUPITER W. | 82 3 29 | 2216 | 83 51 33 | 2228 | 85 39 19 | 2241 | 87 26 46 | 2253 |
| | α Pegasi W. | 69 37 49 | 2647 | 71 15 40 | 2649 | 72 53 29 | 2652 | 74 31 13 | 2657 |
| | α Arietis W. | 26 0 42 | 2687 | 27 37 40 | 2642 | 29 15 38 | 2608 | 30 54 22 | 2581 |
| | Pollux E. | 51 30 21 | 2199 | 49 41 52 | 2210 | 47 53 40 | 2223 | 46 5 47 | 2237 |
| | Regulus E. | 87 50 55 | 2208 | 86 2 40 | 2220 | 84 14 43 | 2233 | 82 27 4 | 2245 |
| 17 | Fomalhaut W. | 102 11 19 | 2478 | 103 53 3 | 2485 | 105 34 23 | 2514 | 107 15 17 | 2533 |
| | JUPITER W. | 96 19 7 | 2394 | 98 4 31 | 2339 | 99 49 33 | 2355 | 101 34 12 | 2379 |
| | α Pegasi W. | 82 37 32 | 2703 | 84 14 8 | 2716 | 85 50 27 | 2730 | 87 26 27 | 2744 |
| | α Arietis W. | 39 14 30 | 2528 | 40 55 4 | 2527 | 42 35 39 | 2530 | 44 16 11 | 2533 |
| | Pollux E. | 37 11 30 | 2310 | 35 25 45 | 2326 | 33 40 23 | 2342 | 31 55 25 | 2359 |
| | Regulus E. | 73 33 45 | 2317 | 71 48 10 | 2332 | 70 2 57 | 2348 | 68 18 7 | 2364 |
| 18 | JUPITER W. | 110 11 29 | 2457 | 111 53 43 | 2475 | 113 35 32 | 2492 | 115 16 56 | 2510 |
| | α Pegasi W. | 95 21 12 | 2822 | 96 54 58 | 2852 | 98 28 18 | 2873 | 100 1 11 | 2895 |
| | α Arietis W. | 52 36 55 | 2573 | 54 16 27 | 2585 | 55 55 43 | 2596 | 57 34 43 | 2609 |
| | Aldebaran W. | 22 0 9 | 2626 | 23 38 28 | 2618 | 25 16 58 | 2616 | 26 55 31 | 2613 |
| | Regulus E. | 59 39 59 | 2450 | 57 57 36 | 2469 | 56 15 39 | 2487 | 54 34 7 | 2505 |
| | Spica E. | 113 42 59 | 2449 | 112 0 34 | 2465 | 110 18 32 | 2482 | 108 36 54 | 2499 |
| 19 | JUPITER W. | 123 37 36 | 2602 | 125 16 28 | 2621 | 126 54 55 | 2639 | 128 32 57 | 2658 |
| | α Arietis W. | 65 45 11 | 2679 | 67 22 19 | 2695 | 68 59 6 | 2710 | 70 35 33 | 2725 |
| | Aldebaran W. | 35 6 56 | 2654 | 36 44 38 | 2666 | 38 22 4 | 2678 | 39 59 14 | 2690 |
| | Regulus E. | 46 12 59 | 2601 | 44 34 5 | 2620 | 42 55 37 | 2640 | 41 17 36 | 2660 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XV ^h . | P. L. of Diff. | XVIII ^b . | P. L. of Diff. | XXI ^b . | P. L. of Diff. |
|-------------------|-------------------------------|----|-------------|----------------|-------------------|----------------|----------------------|----------------|--------------------|----------------|
| 12 | α Aquilæ | W. | 73° 33' 17" | 3004 | 75° 3' 25" | 2983 | 76° 33' 59" | 2965 | 78° 4' 55" | 2950 |
| | Fomalhaut | W. | 39 29 41 | 2535 | 41 10 5 | 2499 | 42 51 19 | 2469 | 44 33 16 | 2441 |
| | JUPITER | W. | 30 42 20 | 2153 | 32 31 58 | 2145 | 34 21 48 | 2138 | 36 11 49 | 2132 |
| | α Arietis | E. | 30 27 13 | 2519 | 28 46 16 | 2558 | 27 6 23 | 2614 | 25 27 47 | 2684 |
| | Aldebaran | E. | 59 9 22 | 2147 | 57 19 35 | 2145 | 55 29 44 | 2149 | 53 39 49 | 2140 |
| | Pollux | E. | 103 8 35 | 2119 | 101 17 54 | 2107 | 99 27 6 | 2103 | 97 36 11 | 2098 |
| 13 | α Aquilæ | W. | 85 43 38 | 2903 | 87 15 53 | 2901 | 88 48 11 | 2899 | 90 20 31 | 2901 |
| | Fomalhaut | W. | 53 11 21 | 2346 | 54 56 13 | 2335 | 56 41 22 | 2324 | 58 26 46 | 2315 |
| | JUPITER | W. | 45 23 53 | 2113 | 47 14 32 | 2111 | 49 5 14 | 2111 | 50 55 57 | 2111 |
| | α Pegasi | W. | 38 19 22 | 2976 | 39 44 2 | 3184 | 41 10 30 | 3105 | 42 38 33 | 3036 |
| | Aldebaran | E. | 44 29 57 | 2144 | 42 40 5 | 2148 | 40 50 19 | 2153 | 39 0 41 | 2160 |
| | Pollux | E. | 88 20 20 | 2087 | 86 29 1 | 2087 | 84 37 42 | 2087 | 82 46 23 | 2087 |
| 14 | α Aquilæ | W. | 98 0 55 | 2938 | 99 32 26 | 2951 | 101 3 40 | 2967 | 102 34 34 | 2985 |
| | Fomalhaut | W. | 67 16 12 | 2294 | 69 2 20 | 2295 | 70 48 27 | 2296 | 72 34 33 | 2297 |
| | JUPITER | W. | 60 9 8 | 2122 | 61 59 34 | 2126 | 63 49 53 | 2131 | 65 40 5 | 2137 |
| | α Pegasi | W. | 50 17 5 | 2901 | 51 51 32 | 2771 | 53 26 38 | 2744 | 55 2 19 | 2729 |
| | Aldebaran | E. | 29 55 53 | 2222 | 28 7 58 | 2243 | 26 20 34 | 2267 | 24 33 46 | 2295 |
| | Pollux | E. | 73 30 24 | 2101 | 71 39 27 | 2106 | 69 48 37 | 2111 | 67 57 55 | 2118 |
| 15 | Fomalhaut | W. | 81 23 49 | 2294 | 83 9 14 | 2331 | 84 54 28 | 2341 | 86 39 28 | 2350 |
| | JUPITER | W. | 74 48 35 | 2174 | 76 37 41 | 2184 | 78 26 32 | 2194 | 80 15 8 | 2204 |
| | α Pegasi | W. | 63 6 44 | 2657 | 64 44 22 | 2659 | 66 22 7 | 2648 | 67 59 57 | 2646 |
| | Pollux | E. | 58 47 2 | 2157 | 56 57 29 | 2167 | 55 8 11 | 2176 | 53 19 8 | 2187 |
| | Regulus | E. | 95 6 34 | 2167 | 93 17 17 | 2176 | 91 28 14 | 2187 | 89 39 27 | 2197 |
| 16 | Fomalhaut | W. | 95 20 28 | 2413 | 97 3 44 | 2429 | 98 46 38 | 2444 | 100 29 10 | 2460 |
| | JUPITER | W. | 89 13 55 | 2266 | 91 0 44 | 2280 | 92 47 13 | 2294 | 94 33 21 | 2309 |
| | α Pegasi | W. | 76 8 50 | 2664 | 77 46 18 | 2672 | 79 23 36 | 2681 | 81 0 41 | 2692 |
| | α Arietis | W. | 32 33 43 | 2561 | 34 13 31 | 2547 | 35 53 39 | 2538 | 37 34 0 | 2531 |
| | Pollux | E. | 44 18 14 | 2250 | 42 31 1 | 2264 | 40 44 9 | 2279 | 38 57 38 | 2294 |
| | Regulus | E. | 80 39 43 | 2258 | 78 52 42 | 2272 | 77 6 2 | 2287 | 75 19 43 | 2301 |
| 17 | Fomalhaut | W. | 108 55 44 | 2553 | 110 35 43 | 2574 | 112 15 13 | 2596 | 113 54 14 | 2618 |
| | JUPITER | W. | 103 18 27 | 2389 | 105 2 18 | 2405 | 106 45 46 | 2422 | 108 28 50 | 2439 |
| | α Pegasi | W. | 89 2 8 | 2760 | 90 37 28 | 2777 | 92 12 26 | 2795 | 93 47 1 | 2813 |
| | α Arietis | W. | 45 56 39 | 2538 | 47 36 59 | 2545 | 49 17 10 | 2553 | 50 57 9 | 2563 |
| | Pollux | E. | 30 10 52 | 2377 | 28 26 44 | 2396 | 26 43 3 | 2414 | 24 59 48 | 2433 |
| | Regulus | E. | 66 33 41 | 2381 | 64 49 39 | 2396 | 63 6 1 | 2415 | 61 22 48 | 2439 |
| 18 | JUPITER | W. | 116 57 55 | 2599 | 118 38 28 | 2547 | 120 18 36 | 2585 | 121 58 19 | 2584 |
| | α Pegasi | W. | 101 33 36 | 2918 | 103 5 32 | 2941 | 104 36 59 | 2965 | 106 7 55 | 2991 |
| | α Arietis | W. | 59 13 26 | 2692 | 60 51 51 | 2636 | 62 29 57 | 2650 | 64 7 44 | 2665 |
| | Aldebaran | W. | 28 31 4 | 2630 | 30 12 32 | 2696 | 31 50 51 | 2634 | 33 29 0 | 2643 |
| | Regulus | E. | 52 53 1 | 2584 | 51 12 21 | 2543 | 49 32 7 | 2562 | 47 52 20 | 2581 |
| | Spica | E. | 106 55 40 | 2517 | 105 14 50 | 2535 | 103 34 25 | 2559 | 101 54 24 | 2569 |
| 19 | JUPITER | W. | 130 10 33 | 2677 | 131 47 44 | 2695 | 133 24 31 | 2713 | 135 0 53 | 2731 |
| | α Arietis | W. | 72 11 39 | 2741 | 73 47 25 | 2756 | 75 22 50 | 2772 | 76 57 54 | 2788 |
| | Aldebaran | W. | 41 36 7 | 2704 | 43 12 42 | 2716 | 44 49 0 | 2731 | 46 24 59 | 2745 |
| | Regulus | E. | 39 40 2 | 2680 | 38 2 55 | 2701 | 36 26 16 | 2721 | 34 50 4 | 2741 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|--------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
| 19 | Spica E. | 100° 14' 47" | 2587 | 98° 35' 34" | 2604 | 96° 56' 45" | 2622 | 95° 18' 20" | 2640 |
| | Sun E. | 134 35 5 | 2912 | 133 3 1 | 2931 | 131 31 21 | 2950 | 130 0 6 | 2969 |
| 20 | α Arietis W. | 78 32 37 | 2804 | 80 7 0 | 2820 | 81 41 2 | 2835 | 83 14 44 | 2851 |
| | Aldebaran W. | 48 0 39 | 2760 | 49 36 0 | 2774 | 51 11 2 | 2788 | 52 45 45 | 2803 |
| | Regulus E. | 33 14 19 | 2763 | 31 39 3 | 2785 | 30 4 15 | 2807 | 28 29 56 | 2831 |
| | Spica E. | 87 12 7 | 2725 | 85 36 1 | 2742 | 84 0 17 | 2759 | 82 24 55 | 2775 |
| | Sun E. | 122 29 44 | 3062 | 121 0 48 | 3081 | 119 32 15 | 3098 | 118 4 3 | 3116 |
| 21 | α Arietis W. | 90 58 16 | 2927 | 92 30 1 | 2942 | 94 1 27 | 2956 | 95 32 35 | 2969 |
| | Aldebaran W. | 60 34 44 | 2872 | 62 7 39 | 2886 | 63 40 16 | 2899 | 65 12 37 | 2911 |
| | Pollux W. | 16 18 6 | 2876 | 17 50 56 | 2884 | 19 23 35 | 2894 | 20 56 2 | 2904 |
| | Spica E. | 74 33 19 | 2853 | 73 0 0 | 2868 | 71 27 0 | 2882 | 69 54 18 | 2896 |
| | Sun E. | 110 48 19 | 3129 | 109 22 9 | 3215 | 107 56 18 | 3231 | 106 30 45 | 3246 |
| 22 | α Arietis W. | 103 3 57 | 3037 | 104 33 24 | 3050 | 106 2 35 | 3069 | 107 31 31 | 3073 |
| | Aldebaran W. | 72 50 25 | 2971 | 74 21 14 | 2981 | 75 51 50 | 2992 | 77 22 13 | 3001 |
| | Pollux W. | 28 35 6 | 2954 | 30 6 16 | 2965 | 31 37 13 | 2974 | 33 7 58 | 2983 |
| | Spica E. | 62 15 8 | 2961 | 60 44 6 | 2973 | 59 13 19 | 2985 | 57 42 47 | 2995 |
| | Sun E. | 99 27 14 | 3213 | 98 3 18 | 3226 | 96 39 37 | 3238 | 95 16 9 | 3249 |
| 23 | Aldebaran W. | 84 51 13 | 3045 | 86 20 30 | 3053 | 87 49 37 | 3060 | 89 18 36 | 3066 |
| | Pollux W. | 40 38 59 | 3025 | 42 8 41 | 3032 | 43 38 14 | 3039 | 45 7 39 | 3044 |
| | Spica E. | 50 13 22 | 3045 | 48 44 5 | 3055 | 47 15 0 | 3063 | 45 46 5 | 3070 |
| | Sun E. | 88 21 53 | 3228 | 86 59 34 | 3247 | 85 37 25 | 3244 | 84 15 24 | 3252 |
| 24 | Aldebaran W. | 96 41 41 | 3092 | 98 10 0 | 3096 | 99 38 14 | 3100 | 101 6 24 | 3108 |
| | Pollux W. | 52 33 2 | 3089 | 54 1 50 | 3073 | 55 30 33 | 3075 | 56 59 13 | 3078 |
| | Regulus W. | 16 49 46 | 3229 | 18 15 9 | 3218 | 19 40 57 | 3201 | 21 7 5 | 3187 |
| | Spica E. | 38 23 51 | 3108 | 36 55 51 | 3114 | 35 27 59 | 3121 | 34 0 15 | 3128 |
| | Sun E. | 77 27 12 | 3449 | 76 5 51 | 3454 | 74 44 35 | 3457 | 73 23 23 | 3460 |
| 25 | Aldebaran W. | 108 26 31 | 3111 | 109 54 27 | 3111 | 111 22 23 | 3112 | 112 50 18 | 3112 |
| | Pollux W. | 64 21 57 | 3083 | 65 50 27 | 3083 | 67 18 57 | 3083 | 68 47 27 | 3082 |
| | Regulus W. | 28 21 4 | 3146 | 29 48 18 | 3139 | 31 15 40 | 3134 | 32 43 8 | 3129 |
| | Sun E. | 66 38 0 | 3467 | 65 16 59 | 3467 | 63 55 58 | 3467 | 62 34 57 | 3465 |
| 26 | Pollux W. | 76 10 30 | 3070 | 77 39 16 | 3067 | 79 8 6 | 3063 | 80 37 1 | 3059 |
| | Regulus W. | 40 2 4 | 3103 | 41 30 10 | 3097 | 42 58 23 | 3092 | 44 26 42 | 3086 |
| | Sun E. | 55 49 23 | 3454 | 54 28 8 | 3450 | 53 6 48 | 3446 | 51 45 24 | 3441 |
| 27 | Pollux W. | 88 3 1 | 3033 | 89 32 33 | 3026 | 91 2 13 | 3021 | 92 32 0 | 3014 |
| | Regulus W. | 51 50 12 | 3084 | 53 19 18 | 3047 | 54 48 33 | 3039 | 56 17 57 | 3028 |
| | Sun E. | 44 56 57 | 3414 | 43 34 56 | 3408 | 42 12 48 | 3400 | 40 50 32 | 3393 |
| 28 | Pollux W. | 100 3 9 | 2977 | 101 33 51 | 2969 | 103 4 43 | 2960 | 104 35 46 | 2952 |
| | Regulus W. | 63 47 20 | 2992 | 65 17 43 | 2983 | 66 48 17 | 2975 | 68 19 1 | 2965 |
| | Sun E. | 33 57 4 | 3253 | 32 33 54 | 3245 | 31 10 35 | 3237 | 29 47 6 | 3227 |
| 29 | Regulus W. | 75 55 35 | 2920 | 77 27 29 | 2910 | 78 59 25 | 2901 | 80 31 53 | 2891 |
| | Spica W. | 22 9 7 | 3014 | 23 39 3 | 2993 | 25 9 25 | 2973 | 26 40 12 | 2954 |
| | Sun E. | 22 47 2 | 3282 | 21 22 29 | 3272 | 19 57 45 | 3263 | 18 32 50 | 3254 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIb. | P. L. of Diff. | XXIb. | P. L. of Diff. |
|-------------------|-------------------------------|----|-------------|----------------|------------|----------------|-------------|----------------|-------------|----------------|
| 19 | Spica | E. | 93° 40' 19" | 2657 | 92° 2' 41" | 2675 | 90° 25' 27" | 2692 | 88° 48' 36" | 2708 |
| | Sun | E. | 128 29 15 | 2686 | 126 58 47 | 3007 | 125 28 43 | 3026 | 123 59 2 | 3044 |
| 20 | α Arietis | W. | 84 48 6 | 2686 | 86 21 8 | 2682 | 87 53 50 | 2697 | 89 26 13 | 2612 |
| | Aldebaran | W. | 54 20 9 | 2617 | 55 54 15 | 2631 | 57 28 2 | 2645 | 59 1 32 | 2659 |
| | Regulus | E. | 26 56 8 | 2655 | 25 22 51 | 2681 | 23 50 8 | 2696 | 22 17 59 | 2637 |
| | Spica | E. | 80 49 54 | 2702 | 79 15 15 | 2607 | 77 40 56 | 2623 | 76 6 58 | 2638 |
| | Sun | E. | 116 36 13 | 3133 | 115 8 44 | 3151 | 113 41 36 | 3168 | 112 14 48 | 3163 |
| 21 | α Arietis | W. | 97 3 26 | 2684 | 98 33 59 | 2697 | 100 4 15 | 2611 | 101 34 14 | 2684 |
| | Aldebaran | W. | 66 44 42 | 2694 | 68 16 31 | 2636 | 69 48 4 | 2648 | 71 19 22 | 2660 |
| | Pollux | W. | 22 28 16 | 2613 | 24 0 18 | 2604 | 25 32 7 | 2634 | 27 3 43 | 2644 |
| | Spica | E. | 68 21 54 | 2609 | 66 49 47 | 2624 | 65 17 58 | 2636 | 63 46 25 | 2649 |
| | Sun | E. | 105 5 30 | 2660 | 103 40 32 | 2674 | 102 15 50 | 2688 | 100 51 24 | 2301 |
| 22 | α Arietis | W. | 109 0 13 | 2685 | 110 28 41 | 2697 | 111 56 54 | 2108 | 113 24 54 | 2120 |
| | Aldebaran | W. | 78 52 24 | 2611 | 80 22 23 | 2621 | 81 52 10 | 2629 | 83 21 47 | 2638 |
| | Pollux | W. | 34 38 32 | 2693 | 36 8 54 | 2601 | 37 39 6 | 2609 | 39 9 7 | 2617 |
| | Spica | E. | 56 12 28 | 2606 | 54 42 23 | 2616 | 53 12 30 | 2626 | 51 42 50 | 2636 |
| | Sun | E. | 93 52 54 | 2360 | 92 29 52 | 2370 | 91 7 1 | 2380 | 89 44 22 | 2389 |
| 23 | Aldebaran | W. | 90 47 27 | 2672 | 92 16 11 | 2678 | 93 44 47 | 2683 | 95 13 17 | 2688 |
| | Pollux | W. | 46 36 57 | 2651 | 48 6 7 | 2656 | 49 35 11 | 2660 | 51 4 9 | 2665 |
| | Spica | E. | 44 17 19 | 2678 | 42 48 43 | 2687 | 41 20 17 | 2694 | 39 52 0 | 2101 |
| | Sun | E. | 82 53 32 | 2428 | 81 31 47 | 2434 | 80 10 9 | 2440 | 78 48 38 | 2445 |
| 24 | Aldebaran | W. | 102 34 31 | 2105 | 104 2 34 | 2107 | 105 30 35 | 2109 | 106 58 34 | 2110 |
| | Pollux | W. | 58 27 50 | 2680 | 59 56 24 | 2682 | 61 24 56 | 2682 | 62 53 27 | 2683 |
| | Regulus | W. | 22 33 30 | 2176 | 24 0 8 | 2166 | 25 26 58 | 2158 | 26 53 57 | 2152 |
| | Spica | E. | 32 32 39 | 2135 | 31 5 12 | 2142 | 29 37 53 | 2149 | 28 10 43 | 2156 |
| | Sun | E. | 72 2 14 | 2463 | 70 41 8 | 2464 | 69 20 4 | 2465 | 67 59 1 | 2467 |
| 25 | Aldebaran | W. | 114 18 13 | 2111 | 115 46 9 | 2110 | 117 14 6 | 2109 | 118 42 5 | 2107 |
| | Pollux | W. | 70 15 59 | 2680 | 71 44 33 | 2678 | 73 13 9 | 2676 | 74 41 48 | 2673 |
| | Regulus | W. | 34 10 43 | 2194 | 35 38 24 | 2119 | 37 6 11 | 2114 | 38 34 4 | 2108 |
| | Sun | E. | 61 13 54 | 2464 | 59 52 50 | 2462 | 58 31 43 | 2460 | 57 10 34 | 2458 |
| 26 | Pollux | W. | 82 6 1 | 2655 | 83 35 6 | 2649 | 85 4 18 | 2644 | 86 33 36 | 2639 |
| | Regulus | W. | 45 55 9 | 2680 | 47 23 43 | 2673 | 48 52 25 | 2668 | 50 21 14 | 2660 |
| | Sun | E. | 50 23 54 | 2437 | 49 2 19 | 2431 | 47 40 38 | 2426 | 46 18 51 | 2420 |
| 27 | Pollux | W. | 94 1 56 | 2606 | 95 32 1 | 2600 | 97 2 14 | 2599 | 98 32 37 | 2595 |
| | Regulus | W. | 57 47 30 | 2624 | 59 17 13 | 2617 | 60 47 5 | 2609 | 62 17 7 | 2600 |
| | Sun | E. | 39 28 8 | 2386 | 38 5 35 | 2379 | 36 42 54 | 2371 | 35 20 4 | 2362 |
| 28 | Pollux | W. | 106 6 59 | 2643 | 107 38 23 | 2635 | 109 9 58 | 2626 | 110 41 44 | 2616 |
| | Regulus | W. | 69 49 57 | 2657 | 71 21 4 | 2647 | 72 52 23 | 2639 | 74 23 53 | 2629 |
| | Sun | E. | 28 23 26 | 2319 | 26 59 36 | 2309 | 25 35 35 | 2300 | 24 11 24 | 2291 |
| 29 | Regulus | W. | 82 4 24 | 2681 | 83 37 7 | 2672 | 85 10 2 | 2662 | 86 43 10 | 2652 |
| | Spica | W. | 28 11 22 | 2637 | 29 42 54 | 2620 | 31 14 47 | 2605 | 32 46 59 | 2591 |
| | Sun | E. | 17 7 45 | 2646 | 15 42 30 | 2627 | 14 17 5 | 2620 | 12 51 31 | 2603 |

AT GREENWICH APPARENT NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | | | Sidereal Time of Semi-diameter Passing Meridian. | Equation of Time, to be Subtracted from | Diff. for 1 Hour. |
|------------------|-------------------|--|-------------------|-----------------------|-------------------|----------------|-------------------------|--|---|-------------------|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination. | Diff. for 1 Hour. | Semi-diameter. | Added to Apparent Time. | | | |
| | | | | | | | | | | |
| Tues. | 1 | ^h 16 ^m 29 ^s 19.58 | 10.802 | S. 21° 49' 8.5 | -23.35 | 16' 15.89 | 70.29 | ^m 10 ^s 52.11 | 0.943 | |
| Wed. | 2 | 16 33 39.16 | 10.829 | 21 58 16.5 | 22.30 | 16 16.04 | 70.38 | 10 29.15 | 0.969 | |
| Thur. | 3 | 16 37 59.36 | 10.854 | 22 6 59.0 | 21.23 | 16 16.19 | 70.46 | 10 5.58 | 0.994 | |
| Frid. | 4 | 16 42 20.15 | 10.878 | 22 15 15.8 | -20.16 | 16 16.33 | 70.54 | 9 41.41 | 1.018 | |
| Sat. | 5 | 16 46 41.51 | 10.901 | 22 23 6.7 | 19.07 | 16 16.47 | 70.62 | 9 16.67 | 1.041 | |
| SUN. | 6 | 16 51 3.40 | 10.923 | 22 30 31.3 | 17.97 | 16 16.61 | 70.69 | 8 51.40 | 1.063 | |
| Mon. | 7 | 16 55 25.80 | 10.943 | 22 37 29.5 | -16.86 | 16 16.74 | 70.76 | 8 25.64 | 1.083 | |
| Tues. | 8 | 16 59 48.68 | 10.962 | 22 44 1.0 | 15.75 | 16 16.87 | 70.83 | 7 59.40 | 1.102 | |
| Wed. | 9 | 17 4 12.01 | 10.980 | 22 50 5.7 | 14.63 | 16 17.00 | 70.89 | 7 32.70 | 1.120 | |
| Thur. | 10 | 17 8 35.75 | 10.997 | 22 55 43.3 | -13.50 | 16 17.12 | 70.95 | 7 5.58 | 1.137 | |
| Frid. | 11 | 17 12 59.89 | 11.012 | 23 0 53.6 | 12.36 | 16 17.24 | 71.00 | 6 38.08 | 1.152 | |
| Sat. | 12 | 17 17 24.40 | 11.027 | 23 5 36.5 | 11.22 | 16 17.35 | 71.05 | 6 10.21 | 1.167 | |
| SUN. | 13 | 17 21 49.24 | 11.040 | 23 9 51.9 | -10.07 | 16 17.45 | 71.10 | 5 42.00 | 1.180 | |
| Mon. | 14 | 17 26 14.39 | 11.053 | 23 13 39.7 | 8.91 | 16 17.55 | 71.14 | 5 13.49 | 1.192 | |
| Tues. | 15 | 17 30 39.62 | 11.064 | 23 16 59.6 | 7.75 | 16 17.64 | 71.18 | 4 44.70 | 1.204 | |
| Wed. | 16 | 17 35 5.50 | 11.074 | 23 19 51.6 | -6.58 | 16 17.73 | 71.21 | 4 15.65 | 1.214 | |
| Thur. | 17 | 17 39 31.41 | 11.083 | 23 22 15.7 | 5.41 | 16 17.81 | 71.24 | 3 46.38 | 1.222 | |
| Frid. | 18 | 17 43 57.51 | 11.091 | 23 24 11.7 | 4.24 | 16 17.88 | 71.26 | 3 16.91 | 1.230 | |
| Sat. | 19 | 17 48 23.78 | 11.097 | 23 25 39.6 | -3.07 | 16 17.95 | 71.28 | 2 47.28 | 1.236 | |
| SUN. | 20 | 17 52 50.18 | 11.103 | 23 26 39.3 | 1.90 | 16 18.01 | 71.29 | 2 17.52 | 1.242 | |
| Mon. | 21 | 17 57 16.69 | 11.107 | 23 27 10.8 | -0.73 | 16 18.07 | 71.30 | 1 47.65 | 1.246 | |
| Tues. | 22 | 18 1 43.28 | 11.109 | 23 27 14.1 | +0.45 | 16 18.12 | 71.30 | 1 17.71 | 1.248 | |
| Wed. | 23 | 18 6 9.90 | 11.110 | 23 26 49.1 | 1.63 | 16 18.16 | 71.30 | 0 47.73 | 1.249 | |
| Thur. | 24 | 18 10 36.52 | 11.109 | 23 25 55.8 | 2.81 | 16 18.20 | 71.29 | 0 17.75 | 1.248 | |
| Frid. | 25 | 18 15 3.11 | 11.107 | 23 24 34.2 | +3.99 | 16 18.24 | 71.28 | 0 12.20 | 1.246 | |
| Sat. | 26 | 18 19 29.64 | 11.103 | 23 22 44.3 | 5.17 | 16 18.27 | 71.27 | 0 42.09 | 1.242 | |
| SUN. | 27 | 18 23 56.06 | 11.098 | 23 20 26.2 | 6.34 | 16 18.30 | 71.25 | 1 11.87 | 1.237 | |
| Mon. | 28 | 18 28 22.34 | 11.091 | 23 17 39.9 | +7.51 | 16 18.32 | 71.23 | 1 41.51 | 1.231 | |
| Tues. | 29 | 18 32 48.45 | 11.083 | 23 14 25.5 | 8.67 | 16 18.34 | 71.20 | 2 10.98 | 1.223 | |
| Wed. | 30 | 18 37 14.34 | 11.074 | 23 10 43.2 | 9.84 | 16 18.35 | 71.17 | 2 40.23 | 1.213 | |
| Thur. | 31 | 18 41 39.98 | 11.063 | 23 6 33.0 | 11.00 | 16 18.36 | 71.13 | 3 9.23 | 1.202 | |
| Frid. | 32 | 18 46 5.33 | 11.050 | S. 23 1 54.9 | +12.16 | 16 18.37 | 71.09 | 3 37.94 | 1.189 | |

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.19 from the sidereal time.
 The sign — prefixed to the hourly change of declination indicates that south declinations are increasing;
 the sign + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

| Day of the Week. | Day of the Month. | THE SUN'S | | | | Equation of Time, to be Added to | Diff. for 1 Hour. | Sidereal Time, or Right Ascension of Mean Sun. |
|------------------|-------------------|--|-------------------|--|-------------------|----------------------------------|-------------------|--|
| | | Apparent Right Ascension. | Diff. for 1 Hour. | Apparent Declination | Diff. for 1 Hour. | | | |
| | | ^h ^m ^s | ^s | [°] ['] ["] | | Subtracted from Mean Time. | | ^h ^m ^s |
| Tues. | 1 | 16 29 21.54 | 10.800 | S. 21 49 12.7 | -23.34 | 10 51.94 | 0.943 | 16 40 13.48 |
| Wed. | 2 | 16 33 41.06 | 10.826 | 21 58 20.4 | 22.29 | 10 28.98 | 0.969 | 16 44 10.04 |
| Thur. | 3 | 16 38 1.19 | 10.851 | 22 7 2.6 | 21.23 | 10 5.41 | 0.994 | 16 48 6.60 |
| Frid. | 4 | 16 42 21.91 | 10.875 | 22 15 19.1 | -20.15 | 9 41.25 | 1.018 | 16 52 3.16 |
| Sat. | 5 | 16 46 43.20 | 10.898 | 22 23 9.6 | 19.06 | 9 16.52 | 1.041 | 16 55 59.72 |
| SUN. | 6 | 16 51 5.02 | 10.920 | 22 30 33.9 | 17.96 | 8 51.25 | 1.063 | 16 59 56.27 |
| Mon. | 7 | 16 55 27.34 | 10.940 | 22 37 31.8 | -16.85 | 8 25.49 | 1.083 | 17 3 52.83 |
| Tues. | 8 | 16 59 50.14 | 10.950 | 22 44 3.1 | 15.74 | 7 59.25 | 1.102 | 17 7 49.39 |
| Wed. | 9 | 17 4 13.39 | 10.977 | 22 50 7.5 | 14.62 | 7 32.56 | 1.120 | 17 11 45.95 |
| Thur. | 10 | 17 8 37.05 | 10.994 | 22 55 44.8 | -13.49 | 7 5.45 | 1.137 | 17 15 42.50 |
| Frid. | 11 | 17 13 1.11 | 11.009 | 23 0 54.9 | 12.35 | 6 37.95 | 1.152 | 17 19 39.06 |
| Sat. | 12 | 17 17 25.53 | 11.024 | 23 5 37.6 | 11.21 | 6 10.09 | 1.167 | 17 23 35.62 |
| SUN. | 13 | 17 21 50.29 | 11.037 | 23 9 52.8 | -10.06 | 5 41.89 | 1.180 | 17 27 32.18 |
| Mon. | 14 | 17 26 15.35 | 11.050 | 23 13 40.4 | 8.90 | 5 13.39 | 1.192 | 17 31 28.74 |
| Tues. | 15 | 17 30 40.69 | 11.061 | 23 17 0.2 | 7.74 | 4 44.61 | 1.204 | 17 35 25.30 |
| Wed. | 16 | 17 35 6.29 | 11.071 | 23 19 52.1 | -6.57 | 4 15.57 | 1.214 | 17 39 21.86 |
| Thur. | 17 | 17 39 32.11 | 11.079 | 23 22 16.1 | 5.40 | 3 46.31 | 1.222 | 17 43 18.42 |
| Frid. | 18 | 17 43 58.12 | 11.087 | 23 24 12.0 | 4.24 | 3 16.85 | 1.230 | 17 47 14.97 |
| Sat. | 19 | 17 48 24.30 | 11.093 | 23 25 39.8 | -3.07 | 2 47.23 | 1.236 | 17 51 11.53 |
| SUN. | 20 | 17 52 50.61 | 11.099 | 23 26 39.5 | 1.90 | 2 17.48 | 1.242 | 17 55 8.09 |
| Mon. | 21 | 17 57 17.03 | 11.103 | 23 27 10.9 | -0.73 | 1 47.62 | 1.246 | 17 59 4.65 |
| Tues. | 22 | 18 1 43.52 | 11.105 | 23 27 14.1 | +0.45 | 1 17.69 | 1.248 | 18 3 1.21 |
| Wed. | 23 | 18 6 10.05 | 11.106 | 23 26 49.1 | 1.63 | 0 47.72 | 1.249 | 18 6 57.77 |
| Thur. | 24 | 18 10 36.58 | 11.105 | 23 25 55.8 | 2.81 | 0 17.75 | 1.248 | 18 10 54.33 |
| Frid. | 25 | 18 15 3.08 | 11.103 | 23 24 34.2 | +3.99 | 0 12.19 | 1.246 | 18 14 50.89 |
| Sat. | 26 | 18 19 29.51 | 11.099 | 23 22 44.3 | 5.17 | 0 42.07 | 1.242 | 18 18 47.44 |
| SUN. | 27 | 18 23 55.84 | 11.094 | 23 20 26.3 | 6.34 | 1 11.84 | 1.237 | 18 22 44.00 |
| Mon. | 28 | 18 28 22.03 | 11.088 | 23 17 40.1 | +7.51 | 1 41.47 | 1.231 | 18 26 40.56 |
| Tues. | 29 | 18 32 48.05 | 11.080 | 23 14 25.9 | 8.67 | 2 10.93 | 1.223 | 18 30 37.12 |
| Wed. | 30 | 18 37 13.85 | 11.070 | 23 10 43.6 | 9.84 | 2 40.17 | 1.213 | 18 34 33.68 |
| Thur. | 31 | 18 41 39.40 | 11.059 | 23 6 33.5 | 11.00 | 3 9.16 | 1.202 | 18 38 30.24 |
| Frid. | 32 | 18 46 4.66 | 11.046 | S. 23 1 55.6 | +12.16 | 3 37.87 | 1.189 | 18 42 26.79 |

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
 The sign — prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 hour,
 +9°.8565.
 (Table III.)

| AT GREENWICH MEAN NOON. | | | | | | | | |
|--|------------------|-----------------|------------|-------------------|-----------|--|-------------------|---|
| Day of the Month. | Day of the Year. | THE SUN'S | | | | Logarithm of the Radius Vector of the Earth. | Diff. for 1 Hour. | Mean Time of Sidereal Noon. |
| | | TRUE LONGITUDE. | | Diff. for 1 Hour. | LATITUDE. | | | |
| | | λ | λ' | | | | | |
| 1 | 335 | 249° 2' 56.4 | 2' 25.2 | 152.20 | — 0.31 | 9.9937740 | —28.9 | ^h 7 ^m 18 ^s 34.47 |
| 2 | 336 | 250 3 49.6 | 3 18.2 | 152.24 | 0.43 | 9.9937068 | 27.7 | 7 14 38.56 |
| 3 | 337 | 251 4 43.8 | 4 12.3 | 152.28 | 0.54 | 9.9936410 | 27.1 | 7 10 42.65 |
| 4 | 338 | 252 5 39.0 | 5 7.3 | 152.31 | — 0.62 | 9.9935766 | —26.5 | 7 6 46.74 |
| 5 | 339 | 253 6 35.0 | 6 3.1 | 152.35 | 0.67 | 9.9935137 | 25.9 | 7 2 50.82 |
| 6 | 340 | 254 7 31.8 | 6 59.7 | 152.38 | 0.70 | 9.9934524 | 25.2 | 6 58 54.91 |
| 7 | 341 | 255 8 29.3 | 7 57.0 | 152.41 | — 0.70 | 9.9933927 | —24.5 | 6 54 59.00 |
| 8 | 342 | 256 9 27.4 | 8 55.0 | 152.44 | 0.67 | 9.9933349 | 23.7 | 6 51 3.09 |
| 9 | 343 | 257 10 26.2 | 9 53.6 | 152.47 | 0.60 | 9.9932792 | 22.8 | 6 47 7.18 |
| 10 | 344 | 258 11 25.6 | 10 52.8 | 152.49 | — 0.51 | 9.9932256 | —21.9 | 6 43 11.27 |
| 11 | 345 | 259 12 25.5 | 11 52.5 | 152.51 | 0.40 | 9.9931744 | 20.9 | 6 39 15.36 |
| 12 | 346 | 260 13 25.9 | 12 52.7 | 152.53 | 0.28 | 9.9931256 | 19.8 | 6 35 19.44 |
| 13 | 347 | 261 14 26.9 | 13 53.5 | 152.56 | — 0.15 | 9.9930794 | —18.7 | 6 31 23.52 |
| 14 | 348 | 262 15 28.5 | 14 54.9 | 152.58 | — 0.01 | 9.9930359 | 17.6 | 6 27 27.61 |
| 15 | 349 | 263 16 30.7 | 15 56.9 | 152.61 | + 0.12 | 9.9929951 | 16.5 | 6 23 31.70 |
| 16 | 350 | 264 17 33.6 | 16 59.6 | 152.63 | + 0.23 | 9.9929570 | —15.3 | 6 19 35.79 |
| 17 | 351 | 265 18 37.1 | 18 3.0 | 152.66 | 0.32 | 9.9929217 | 14.1 | 6 15 39.87 |
| 18 | 352 | 266 19 41.3 | 19 7.0 | 152.69 | 0.39 | 9.9928891 | 13.0 | 6 11 43.96 |
| 19 | 353 | 267 20 46.2 | 20 11.7 | 152.72 | + 0.43 | 9.9928592 | —11.9 | 6 7 48.05 |
| 20 | 354 | 268 21 51.9 | 21 17.2 | 152.75 | 0.45 | 9.9928319 | 10.9 | 6 3 52.14 |
| 21 | 355 | 269 22 58.3 | 22 23.4 | 152.78 | 0.43 | 9.9928071 | 9.8 | 5 59 56.22 |
| 22 | 356 | 270 24 5.4 | 23 30.3 | 152.81 | + 0.38 | 9.9927848 | — 8.8 | 5 56 0.31 |
| 23 | 357 | 271 25 13.1 | 24 37.8 | 152.84 | 0.31 | 9.9927649 | 7.9 | 5 52 4.40 |
| 24 | 358 | 272 26 21.5 | 25 46.0 | 152.86 | 0.22 | 9.9927472 | 7.0 | 5 48 8.49 |
| 25 | 359 | 273 27 30.6 | 26 54.9 | 152.89 | + 0.10 | 9.9927315 | — 6.2 | 5 44 12.57 |
| 26 | 360 | 274 28 40.2 | 28 4.4 | 152.91 | — 0.03 | 9.9927177 | 5.4 | 5 40 16.66 |
| 27 | 361 | 275 29 50.3 | 29 14.3 | 152.93 | 0.16 | 9.9927058 | 4.6 | 5 36 20.75 |
| 28 | 362 | 276 31 0.8 | 30 24.6 | 152.94 | — 0.29 | 9.9926958 | — 3.8 | 5 32 24.84 |
| 29 | 363 | 277 32 11.6 | 31 35.2 | 152.95 | 0.41 | 9.9926875 | 3.1 | 5 28 28.92 |
| 30 | 364 | 278 33 22.6 | 32 46.0 | 152.96 | 0.51 | 9.9926808 | 2.4 | 5 24 33.01 |
| 31 | 365 | 279 34 33.8 | 33 57.0 | 152.96 | 0.60 | 9.9926758 | 1.7 | 5 20 37.10 |
| 32 | 366 | 280 35 45.0 | 35 8.0 | 152.96 | — 0.66 | 9.9926724 | — 1.0 | 5 16 41.19 |
| NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' , to the mean equinox of January 0 ^h .0. | | | | | | | | Diff. for 1 Hour, — 9 ^s .8296. (Table II.) |

GREENWICH MEAN TIME.

THE MOON'S

| Day of the Month. | SEMI- DIAMETER. | | HORIZONTAL PARALLAX. | | | | UPPER TRANSIT. | | AGE. |
|-------------------|-----------------|-----------|----------------------|-------------------|-----------|-------------------|---------------------------|-------------------|--------------|
| | Noon. | Midnight. | Noon. | Diff. for 1 Hour. | Midnight. | Diff. for 1 Hour. | Meridian of Greenwich. | Diff. for 1 Hour. | Noon. |
| | | | | | | | ^h ^m | ^m | ^d |
| 1 | 15 16.4 | 15 20.5 | 55 56.7 | +1.25 | 56 11.7 | +1.26 | 6 | | 0.0 |
| 2 | 15 24.6 | 15 28.7 | 56 26.8 | 1.26 | 56 41.8 | 1.24 | 0 41.8 | 2.28 | 1.0 |
| 3 | 15 32.7 | 15 36.6 | 56 56.5 | 1.22 | 57 10.9 | 1.19 | 1 38.0 | 2.37 | 2.0 |
| 4 | 15 40.5 | 15 44.2 | 57 24.9 | +1.16 | 57 38.6 | +1.13 | 2 35.6 | 2.39 | 3.0 |
| 5 | 15 47.8 | 15 51.2 | 57 51.8 | 1.09 | 58 4.5 | 1.05 | 3 32.7 | 2.34 | 4.0 |
| 6 | 15 54.6 | 15 57.8 | 58 16.8 | 1.01 | 58 28.6 | 0.97 | 4 27.9 | 2.25 | 5.0 |
| 7 | 16 0.9 | 16 3.8 | 58 39.9 | +0.92 | 58 50.6 | +0.87 | 5 20.5 | 2.15 | 6.0 |
| 8 | 16 6.5 | 16 9.0 | 59 0.6 | 0.80 | 59 9.8 | 0.73 | 6 10.9 | 2.07 | 7.0 |
| 9 | 16 11.3 | 16 13.2 | 59 18.0 | 0.64 | 59 25.0 | 0.53 | 6 59.8 | 2.03 | 8.0 |
| 10 | 16 14.7 | 16 15.8 | 59 30.6 | +0.40 | 59 34.6 | +0.26 | 7 48.5 | 2.05 | 9.0 |
| 11 | 16 16.3 | 16 16.4 | 59 36.7 | +0.10 | 59 36.8 | -0.10 | 8 38.2 | 2.12 | 10.0 |
| 12 | 16 15.7 | 16 14.5 | 59 34.5 | -0.30 | 59 29.8 | 0.50 | 9 30.2 | 2.22 | 11.0 |
| 13 | 16 12.5 | 16 9.8 | 59 22.6 | -0.71 | 59 12.8 | -0.92 | 10 25.0 | 2.34 | 12.0 |
| 14 | 16 6.5 | 16 2.5 | 59 0.6 | 1.12 | 58 46.0 | 1.31 | 11 22.7 | 2.44 | 13.0 |
| 15 | 15 58.0 | 15 52.9 | 58 29.3 | 1.47 | 58 10.7 | 1.61 | 12 22.1 | 2.47 | 14.0 |
| 16 | 15 47.5 | 15 41.7 | 57 50.7 | -1.71 | 57 29.6 | -1.79 | 13 21.2 | 2.41 | 15.0 |
| 17 | 15 35.8 | 15 29.8 | 57 7.9 | 1.82 | 56 45.9 | 1.82 | 14 17.9 | 2.28 | 16.0 |
| 18 | 15 23.9 | 15 18.2 | 56 24.2 | 1.79 | 56 3.1 | 1.72 | 15 10.6 | 2.11 | 17.0 |
| 19 | 15 12.7 | 15 7.7 | 55 43.1 | -1.61 | 55 24.5 | -1.49 | 15 59.2 | 1.94 | 18.0 |
| 20 | 15 3.0 | 14 59.0 | 55 7.5 | 1.34 | 54 52.5 | 1.16 | 16 43.9 | 1.80 | 19.0 |
| 21 | 14 55.5 | 14 52.6 | 54 39.7 | 0.97 | 54 29.3 | 0.77 | 17 25.7 | 1.71 | 20.0 |
| 22 | 14 50.5 | 14 49.1 | 54 21.4 | -0.56 | 54 16.1 | -0.33 | 18 5.8 | 1.66 | 21.0 |
| 23 | 14 48.3 | 14 48.3 | 54 13.5 | -0.11 | 54 13.5 | +0.12 | 18 45.2 | 1.65 | 22.0 |
| 24 | 14 49.1 | 14 50.5 | 54 16.2 | +0.34 | 54 21.4 | 0.54 | 19 25.1 | 1.70 | 23.0 |
| 25 | 14 52.6 | 14 55.3 | 54 29.1 | +0.75 | 54 39.2 | +0.94 | 20 6.7 | 1.79 | 24.0 |
| 26 | 14 58.7 | 15 2.5 | 54 51.4 | 1.10 | 55 5.5 | 1.25 | 20 51.0 | 1.92 | 25.0 |
| 27 | 15 6.8 | 15 11.5 | 55 21.2 | 1.37 | 55 38.4 | 1.48 | 21 39.0 | 2.08 | 26.0 |
| 28 | 15 16.4 | 15 21.6 | 55 56.6 | +1.56 | 56 15.6 | +1.60 | 22 31.1 | 2.25 | 27.0 |
| 29 | 15 26.8 | 15 32.1 | 56 34.9 | 1.62 | 56 54.3 | 1.61 | 23 27.1 | 2.38 | 28.0 |
| 30 | 15 37.3 | 15 42.3 | 57 13.4 | 1.56 | 57 31.8 | 1.50 | 6 | | 29.0 |
| 31 | 15 47.1 | 15 51.5 | 57 49.2 | 1.40 | 58 5.4 | 1.29 | 0 25.5 | 2.45 | 0.4 |
| 32 | 15 55.5 | 15 59.0 | 58 20.1 | +1.16 | 58 33.1 | +1.02 | 1 24.5 | 2.47 | 1.4 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|---------------------|------------------|---------------------|-------------|------------------|---------------------|------------------|---------------------|
| TUESDAY 1. | | | | | THURSDAY 3. | | | | |
| 0 | 16 29 5.53 | 2.2368 | S. 23° 0' 23.1" | 7.692 | 0 | 18 22 22.32 | 2.4543 | S. 26° 39' 40.3" | 1.076 |
| 1 | 16 31 19.92 | 2.2467 | 23 8 1.2 | 7.579 | 1 | 18 24 49.65 | 2.4566 | 26 40 40.1 | 0.918 |
| 2 | 16 33 34.66 | 2.2487 | 23 15 32.5 | 7.465 | 2 | 18 27 17.11 | 2.4587 | 26 41 30.4 | 0.759 |
| 3 | 16 35 49.76 | 2.2546 | 23 22 57.0 | 7.350 | 3 | 18 29 44.70 | 2.4608 | 26 42 11.2 | 0.600 |
| 4 | 16 38 5.21 | 2.2604 | 23 30 14.5 | 7.233 | 4 | 18 32 12.41 | 2.4628 | 26 42 42.4 | 0.441 |
| 5 | 16 40 21.00 | 2.2661 | 23 37 25.0 | 7.116 | 5 | 18 34 40.24 | 2.4647 | 26 43 4.1 | 0.282 |
| 6 | 16 42 37.14 | 2.2719 | 23 44 28.4 | 6.997 | 6 | 18 37 8.17 | 2.4663 | 26 43 16.3 | - 0.133 |
| 7 | 16 44 53.62 | 2.2776 | 23 51 24.6 | 6.877 | 7 | 18 39 36.20 | 2.4679 | 26 43 18.9 | + 0.037 |
| 8 | 16 47 10.45 | 2.2833 | 23 58 13.6 | 6.756 | 8 | 18 42 4.32 | 2.4694 | 26 43 11.8 | 0.198 |
| 9 | 16 49 27.62 | 2.2889 | 24 4 55.3 | 6.633 | 9 | 18 44 32.53 | 2.4707 | 26 42 55.1 | 0.359 |
| 10 | 16 51 45.12 | 2.2945 | 24 11 29.6 | 6.509 | 10 | 18 47 0.81 | 2.4719 | 26 42 28.7 | 0.520 |
| 11 | 16 54 2.96 | 2.3001 | 24 17 56.4 | 6.384 | 11 | 18 49 29.16 | 2.4731 | 26 41 52.7 | 0.681 |
| 12 | 16 56 21.13 | 2.3056 | 24 24 15.7 | 6.258 | 12 | 18 51 57.58 | 2.4741 | 26 41 7.0 | 0.842 |
| 13 | 16 58 39.63 | 2.3110 | 24 30 27.4 | 6.131 | 13 | 18 54 26.05 | 2.4749 | 26 40 11.6 | 1.004 |
| 14 | 17 0 58.45 | 2.3164 | 24 36 31.4 | 6.003 | 14 | 18 56 54.57 | 2.4757 | 26 39 6.5 | 1.165 |
| 15 | 17 3 17.60 | 2.3218 | 24 42 27.8 | 5.875 | 15 | 18 59 23.13 | 2.4763 | 26 37 51.8 | 1.326 |
| 16 | 17 5 37.07 | 2.3272 | 24 48 16.4 | 5.744 | 16 | 19 1 51.72 | 2.4768 | 26 36 27.4 | 1.488 |
| 17 | 17 7 56.86 | 2.3324 | 24 53 57.1 | 5.612 | 17 | 19 4 20.34 | 2.4773 | 26 34 53.2 | 1.651 |
| 18 | 17 10 16.96 | 2.3376 | 24 59 29.9 | 5.480 | 18 | 19 6 48.98 | 2.4774 | 26 33 9.3 | 1.813 |
| 19 | 17 12 37.37 | 2.3427 | 25 4 54.7 | 5.347 | 19 | 19 9 17.63 | 2.4775 | 26 31 15.7 | 1.974 |
| 20 | 17 14 58.08 | 2.3477 | 25 10 11.5 | 5.212 | 20 | 19 11 46.28 | 2.4775 | 26 29 12.4 | 2.136 |
| 21 | 17 17 19.10 | 2.3527 | 25 15 20.1 | 5.075 | 21 | 19 14 14.93 | 2.4774 | 26 26 59.4 | 2.297 |
| 22 | 17 19 40.41 | 2.3576 | 25 20 20.5 | 4.938 | 22 | 19 16 43.57 | 2.4779 | 26 24 36.7 | 2.459 |
| 23 | 17 22 2.01 | 2.3625 | S. 25° 25' 12.7" | 4.801 | 23 | 19 19 12.19 | 2.4788 | S. 26° 22' 4.3" | 2.620 |
| WEDNESDAY 2. | | | | | FRIDAY 4. | | | | |
| 0 | 17 24 23.91 | 2.3673 | S. 25° 29' 56.6" | 4.662 | 0 | 19 21 40.79 | 2.4784 | S. 26° 19' 22.3" | 2.781 |
| 1 | 17 26 46.09 | 2.3720 | 25 34 32.1 | 4.522 | 1 | 19 24 9.36 | 2.4788 | 26 16 30.6 | 2.942 |
| 2 | 17 29 8.55 | 2.3766 | 25 38 59.2 | 4.382 | 2 | 19 26 37.89 | 2.4781 | 26 13 29.2 | 3.104 |
| 3 | 17 31 31.28 | 2.3811 | 25 43 17.9 | 4.240 | 3 | 19 29 6.37 | 2.4749 | 26 10 18.1 | 3.265 |
| 4 | 17 33 54.28 | 2.3855 | 25 47 28.0 | 4.097 | 4 | 19 31 34.80 | 2.4733 | 26 6 57.4 | 3.425 |
| 5 | 17 36 17.54 | 2.3899 | 25 51 29.5 | 3.953 | 5 | 19 34 3.17 | 2.4723 | 26 3 27.1 | 3.586 |
| 6 | 17 38 41.07 | 2.3949 | 25 55 22.4 | 3.809 | 6 | 19 36 31.48 | 2.4713 | 25 59 47.1 | 3.746 |
| 7 | 17 41 4.85 | 2.3994 | 25 59 6.6 | 3.663 | 7 | 19 38 59.72 | 2.4700 | 25 55 57.6 | 3.905 |
| 8 | 17 43 28.88 | 2.4025 | 26 2 42.0 | 3.517 | 8 | 19 41 27.88 | 2.4686 | 25 51 58.5 | 4.065 |
| 9 | 17 45 53.15 | 2.4065 | 26 6 8.6 | 3.370 | 9 | 19 43 55.95 | 2.4671 | 25 47 49.8 | 4.224 |
| 10 | 17 48 17.66 | 2.4104 | 26 9 26.4 | 3.222 | 10 | 19 46 23.93 | 2.4655 | 25 43 31.6 | 4.382 |
| 11 | 17 50 42.40 | 2.4142 | 26 12 35.3 | 3.073 | 11 | 19 48 51.81 | 2.4638 | 25 39 4.0 | 4.539 |
| 12 | 17 53 7.36 | 2.4179 | 26 15 35.2 | 2.923 | 12 | 19 51 19.59 | 2.4621 | 25 34 26.9 | 4.697 |
| 13 | 17 55 32.54 | 2.4215 | 26 18 26.1 | 2.773 | 13 | 19 53 47.26 | 2.4602 | 25 29 40.3 | 4.855 |
| 14 | 17 57 57.94 | 2.4251 | 26 21 8.0 | 2.622 | 14 | 19 56 14.81 | 2.4582 | 25 24 44.3 | 5.011 |
| 15 | 18 0 23.55 | 2.4285 | 26 23 40.8 | 2.470 | 15 | 19 58 42.24 | 2.4563 | 25 19 39.0 | 5.166 |
| 16 | 18 2 49.36 | 2.4318 | 26 26 4.4 | 2.318 | 16 | 20 1 9.55 | 2.4540 | 25 14 24.4 | 5.321 |
| 17 | 18 5 15.36 | 2.4350 | 26 28 18.9 | 2.165 | 17 | 20 3 36.72 | 2.4517 | 25 9 0.5 | 5.476 |
| 18 | 18 7 41.56 | 2.4389 | 26 30 24.2 | 2.011 | 18 | 20 6 3.75 | 2.4493 | 25 3 27.3 | 5.631 |
| 19 | 18 10 7.94 | 2.4411 | 26 32 20.2 | 1.856 | 19 | 20 8 30.64 | 2.4469 | 24 57 44.8 | 5.784 |
| 20 | 18 12 34.49 | 2.4439 | 26 34 6.9 | 1.701 | 20 | 20 10 57.38 | 2.4443 | 24 51 53.2 | 5.937 |
| 21 | 18 15 1.21 | 2.4467 | 26 35 44.3 | 1.545 | 21 | 20 13 23.96 | 2.4417 | 24 45 52.4 | 6.089 |
| 22 | 18 17 28.09 | 2.4493 | 26 37 12.3 | 1.389 | 22 | 20 15 50.28 | 2.4390 | 24 39 42.5 | 6.240 |
| 23 | 18 19 55.13 | 2.4519 | 26 38 31.0 | 1.233 | 23 | 20 18 16.64 | 2.4362 | 24 33 23.6 | 6.391 |
| 24 | 18 22 22.32 | 2.4543 | S. 26° 39' 40.3" | 1.076 | 24 | 20 20 42.73 | 2.4333 | S. 24° 26' 55.6" | 6.542 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|---------------------|------------------|---------------------|------------|------------------|---------------------|------------------|---------------------|
| SATURDAY 5. | | | | | MONDAY 7. | | | | |
| 0 | 20 20 42.73 | 2.4333 | S. 24° 26' 55.6" | 6.549 | 0 | 22 13 18.60 | 2.3508 | S. 16° 38' 12.8" | 19.569 |
| 1 | 20 23 8.64 | 2.4304 | 24 20 18.6 | 6.691 | 1 | 22 15 33.53 | 2.3470 | 16 25 36.2 | 19.658 |
| 2 | 20 25 34.38 | 2.4275 | 24 13 32.7 | 6.839 | 2 | 22 17 48.24 | 2.3439 | 16 12 53.9 | 19.753 |
| 3 | 20 27 59.94 | 2.4244 | 24 6 37.9 | 6.987 | 3 | 22 20 2.72 | 2.3395 | 16 0 5.9 | 19.847 |
| 4 | 20 30 25.31 | 2.4213 | 23 59 34.3 | 7.134 | 4 | 22 22 16.98 | 2.3357 | 15 47 12.3 | 19.939 |
| 5 | 20 32 50.49 | 2.4181 | 23 52 21.9 | 7.280 | 5 | 22 24 31.01 | 2.3320 | 15 34 13.2 | 20.030 |
| 6 | 20 35 15.48 | 2.4148 | 23 45 0.7 | 7.426 | 6 | 22 26 44.82 | 2.3284 | 15 21 8.7 | 20.120 |
| 7 | 20 37 40.27 | 2.4115 | 23 37 30.8 | 7.570 | 7 | 22 28 58.42 | 2.3248 | 15 7 58.8 | 20.209 |
| 8 | 20 40 4.86 | 2.4081 | 23 29 52.3 | 7.719 | 8 | 22 31 11.80 | 2.3219 | 14 54 43.6 | 20.296 |
| 9 | 20 42 29.24 | 2.4046 | 23 22 5.3 | 7.854 | 9 | 22 33 24.97 | 2.3177 | 14 41 23.3 | 20.381 |
| 10 | 20 44 53.41 | 2.4011 | 23 14 9.8 | 7.996 | 10 | 22 35 37.93 | 2.3149 | 14 27 57.9 | 20.466 |
| 11 | 20 47 17.37 | 2.3975 | 23 6 5.8 | 8.137 | 11 | 22 37 50.68 | 2.3108 | 14 14 27.4 | 20.550 |
| 12 | 20 49 41.11 | 2.3939 | 22 57 53.3 | 8.277 | 12 | 22 40 3.23 | 2.3075 | 14 0 51.9 | 20.633 |
| 13 | 20 52 4.64 | 2.3909 | 22 49 32.5 | 8.416 | 13 | 22 42 15.58 | 2.3049 | 13 47 11.6 | 20.719 |
| 14 | 20 54 27.94 | 2.3885 | 22 41 3.4 | 8.553 | 14 | 22 44 27.73 | 2.3009 | 13 33 26.5 | 20.799 |
| 15 | 20 56 51.02 | 2.3867 | 22 32 26.1 | 8.690 | 15 | 22 46 39.69 | 2.1977 | 13 19 36.6 | 20.871 |
| 16 | 20 59 13.87 | 2.3790 | 22 23 40.6 | 8.826 | 16 | 22 48 51.45 | 2.1945 | 13 5 42.1 | 20.946 |
| 17 | 21 1 36.50 | 2.3752 | 22 14 47.0 | 8.960 | 17 | 22 51 3.03 | 2.1914 | 12 51 43.1 | 21.021 |
| 18 | 21 3 58.90 | 2.3713 | 22 5 45.4 | 9.093 | 18 | 22 53 14.42 | 2.1883 | 12 37 39.6 | 21.095 |
| 19 | 21 6 21.06 | 2.3674 | 21 56 35.8 | 9.226 | 19 | 22 55 25.63 | 2.1853 | 12 23 31.7 | 21.167 |
| 20 | 21 8 42.99 | 2.3635 | 21 47 18.3 | 9.357 | 20 | 22 57 36.66 | 2.1824 | 12 9 19.5 | 21.239 |
| 21 | 21 11 4.68 | 2.3595 | 21 37 52.9 | 9.488 | 21 | 22 59 47.52 | 2.1796 | 11 55 3.0 | 21.309 |
| 22 | 21 13 26.13 | 2.3556 | 21 28 19.7 | 9.617 | 22 | 23 1 58.21 | 2.1767 | 11 40 42.4 | 21.377 |
| 23 | 21 15 47.35 | 2.3517 | S. 21° 18' 38.8" | 9.745 | 23 | 23 4 8.73 | 2.1739 | S. 11° 26' 17.7" | 21.445 |
| SUNDAY 6. | | | | | TUESDAY 8. | | | | |
| 0 | 21 18 8.33 | 2.3477 | S. 21° 8' 50.3" | 9.879 | 0 | 23 6 19.08 | 2.1719 | S. 11° 11' 49.0" | 21.519 |
| 1 | 21 20 29.07 | 2.3436 | 20 58 54.2 | 9.998 | 1 | 23 8 29.27 | 2.1686 | 10 57 16.3 | 21.576 |
| 2 | 21 22 49.56 | 2.3395 | 20 48 50.6 | 10.123 | 2 | 23 10 39.31 | 2.1661 | 10 42 39.9 | 21.638 |
| 3 | 21 25 9.81 | 2.3354 | 20 38 39.5 | 10.247 | 3 | 23 12 49.20 | 2.1636 | 10 27 59.8 | 21.699 |
| 4 | 21 27 29.81 | 2.3313 | 20 28 21.0 | 10.369 | 4 | 23 14 58.94 | 2.1619 | 10 13 16.0 | 21.761 |
| 5 | 21 29 49.57 | 2.3279 | 20 17 55.2 | 10.490 | 5 | 23 17 8.54 | 2.1588 | 9 58 28.5 | 21.821 |
| 6 | 21 32 9.08 | 2.3239 | 20 7 22.2 | 10.610 | 6 | 23 19 17.99 | 2.1564 | 9 43 37.5 | 21.878 |
| 7 | 21 34 28.35 | 2.3191 | 19 56 42.0 | 10.729 | 7 | 23 21 27.31 | 2.1549 | 9 28 43.1 | 21.934 |
| 8 | 21 36 47.37 | 2.3149 | 19 45 54.7 | 10.847 | 8 | 23 23 36.50 | 2.1521 | 9 13 45.4 | 21.989 |
| 9 | 21 39 6.14 | 2.3108 | 19 35 0.4 | 10.963 | 9 | 23 25 45.56 | 2.1500 | 8 58 44.4 | 22.043 |
| 10 | 21 41 24.67 | 2.3067 | 19 23 59.2 | 11.078 | 10 | 23 27 54.50 | 2.1480 | 8 43 40.2 | 22.096 |
| 11 | 21 43 42.95 | 2.3027 | 19 12 51.0 | 11.193 | 11 | 23 30 3.32 | 2.1460 | 8 28 32.9 | 22.147 |
| 12 | 21 46 0.99 | 2.2986 | 19 1 36.0 | 11.306 | 12 | 23 32 12.02 | 2.1441 | 8 13 22.6 | 22.197 |
| 13 | 21 48 18.78 | 2.2945 | 18 50 14.3 | 11.417 | 13 | 23 34 20.61 | 2.1423 | 7 58 9.3 | 22.245 |
| 14 | 21 50 36.33 | 2.2905 | 18 38 45.9 | 11.527 | 14 | 23 36 29.10 | 2.1406 | 7 42 53.2 | 22.291 |
| 15 | 21 52 53.64 | 2.2864 | 18 27 11.0 | 11.636 | 15 | 23 38 37.49 | 2.1390 | 7 27 34.4 | 22.336 |
| 16 | 21 55 10.70 | 2.2823 | 18 15 29.6 | 11.744 | 16 | 23 40 45.78 | 2.1374 | 7 12 12.9 | 22.381 |
| 17 | 21 57 27.52 | 2.2783 | 18 3 41.7 | 11.852 | 17 | 23 42 53.98 | 2.1358 | 6 56 48.7 | 22.424 |
| 18 | 21 59 44.10 | 2.2743 | 17 51 47.4 | 11.957 | 18 | 23 45 2.08 | 2.1344 | 6 41 22.0 | 22.465 |
| 19 | 22 2 0.44 | 2.2703 | 17 39 46.9 | 12.060 | 19 | 23 47 10.10 | 2.1331 | 6 25 52.9 | 22.505 |
| 20 | 22 4 16.54 | 2.2664 | 17 27 40.2 | 12.163 | 20 | 23 49 18.05 | 2.1318 | 6 10 21.4 | 22.544 |
| 21 | 22 6 32.41 | 2.2625 | 17 15 27.3 | 12.265 | 21 | 23 51 25.92 | 2.1306 | 5 54 47.6 | 22.589 |
| 22 | 22 8 48.04 | 2.2586 | 17 3 8.4 | 12.364 | 22 | 23 53 33.72 | 2.1295 | 5 39 11.6 | 22.631 |
| 23 | 22 11 3.44 | 2.2547 | 16 50 43.6 | 12.463 | 23 | 23 55 41.46 | 2.1285 | 5 23 33.5 | 22.669 |
| 24 | 22 13 18.60 | 2.2508 | S. 16° 38' 12.8" | 12.569 | 24 | 23 57 49.14 | 2.1275 | S. 5° 7' 53.4" | 22.685 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|--|---------------------|-----------------|---------------------|--------------|----------------------------|---------------------|------------------|---------------------|
| WEDNESDAY 9. | | | | | FRIDAY 11. | | | | |
| 0 | ^h 23 ^m 57 ^s 49.14 | 2.1975 | S. 5° 7' 53.4" | 15.685 | 0 | ^h 1° 40' 22.34" | 2.1768 | N. 7° 35' 53.8" | 15.571 |
| 1 | 23 59 56.76 | 2.1966 | 4 52 11.3 | 15.717 | 1 | 1 42 33.02 | 2.1765 | 7 51 26.9 | 15.539 |
| 2 | 0 2 4.33 | 2.1957 | 4 36 27.4 | 15.747 | 2 | 1 44 43.88 | 2.1866 | 8 6 57.6 | 15.490 |
| 3 | 0 4 11.85 | 2.1950 | 4 20 41.7 | 15.776 | 3 | 1 46 54.93 | 2.1857 | 8 22 25.7 | 15.447 |
| 4 | 0 6 19.33 | 2.1944 | 4 4 54.3 | 15.803 | 4 | 1 49 6.16 | 2.1868 | 8 37 51.2 | 15.409 |
| 5 | 0 8 26.78 | 2.1939 | 3 49 5.3 | 15.829 | 5 | 1 51 17.58 | 2.1890 | 8 53 14.0 | 15.357 |
| 6 | 0 10 34.20 | 2.1934 | 3 33 14.8 | 15.854 | 6 | 1 53 29.20 | 2.1953 | 9 8 34.0 | 15.309 |
| 7 | 0 12 41.59 | 2.1930 | 3 17 22.8 | 15.877 | 7 | 1 55 41.02 | 2.1966 | 9 23 51.1 | 15.260 |
| 8 | 0 14 48.96 | 2.1927 | 3 1 29.5 | 15.898 | 8 | 1 57 53.04 | 2.2090 | 9 39 5.2 | 15.209 |
| 9 | 0 16 56.31 | 2.1994 | 2 45 35.0 | 15.918 | 9 | 2 0 5.26 | 2.2055 | 9 54 16.2 | 15.157 |
| 10 | 0 19 3.65 | 2.1992 | 2 29 39.3 | 15.938 | 10 | 2 2 17.70 | 2.2091 | 10 9 24.0 | 15.103 |
| 11 | 0 21 10.98 | 2.1999 | 2 13 42.4 | 15.957 | 11 | 2 4 30.35 | 2.2197 | 10 24 28.5 | 15.047 |
| 12 | 0 23 18.31 | 2.1999 | 1 57 44.5 | 15.973 | 12 | 2 6 43.22 | 2.2163 | 10 39 29.6 | 14.989 |
| 13 | 0 25 25.65 | 2.1993 | 1 41 45.7 | 15.987 | 13 | 2 8 56.31 | 2.2201 | 10 54 27.2 | 14.931 |
| 14 | 0 27 32.99 | 2.1994 | 1 25 46.1 | 16.000 | 14 | 2 11 9.63 | 2.2239 | 11 9 21.3 | 14.870 |
| 15 | 0 29 40.34 | 2.1997 | 1 9 45.7 | 16.012 | 15 | 2 13 23.18 | 2.2278 | 11 24 11.6 | 14.807 |
| 16 | 0 31 47.71 | 2.1931 | 0 53 44.6 | 16.023 | 16 | 2 15 36.96 | 2.2317 | 11 38 58.1 | 14.743 |
| 17 | 0 33 55.11 | 2.1935 | 0 37 42.9 | 16.039 | 17 | 2 17 50.98 | 2.2356 | 11 53 40.8 | 14.678 |
| 18 | 0 36 2.53 | 2.1940 | 0 21 40.8 | 16.039 | 18 | 2 20 5.23 | 2.2395 | 12 8 19.5 | 14.611 |
| 19 | 0 38 9.99 | 2.1946 | S. 0° 5' 38.3" | 16.045 | 19 | 2 22 19.72 | 2.2436 | 12 22 54.1 | 14.542 |
| 20 | 0 40 17.49 | 2.1959 | N. 0° 10' 24.6" | 16.051 | 20 | 2 24 34.46 | 2.2478 | 12 37 24.5 | 14.479 |
| 21 | 0 42 25.02 | 2.1959 | 0 26 27.8 | 16.054 | 21 | 2 26 49.46 | 2.2521 | 12 51 50.7 | 14.400 |
| 22 | 0 44 32.60 | 2.1968 | 0 42 31.1 | 16.055 | 22 | 2 29 4.71 | 2.2562 | 13 6 12.5 | 14.326 |
| 23 | 0 46 40.24 | 2.1977 | N. 0° 58' 34.4" | 16.055 | 23 | 2 31 20.21 | 2.2604 | N. 13° 20' 29.8" | 14.250 |
| THURSDAY 10. | | | | | SATURDAY 12. | | | | |
| 0 | 0 48 47.93 | 2.1987 | N. 1° 14' 37.7" | 16.053 | 0 | 2 33 35.96 | 2.2647 | N. 13° 34' 42.5" | 14.179 |
| 1 | 0 50 55.68 | 2.1998 | 1 30 40.8 | 16.051 | 1 | 2 35 51.97 | 2.2691 | 13 48 50.5 | 14.094 |
| 2 | 0 53 3.50 | 2.1910 | 1 46 43.8 | 16.047 | 2 | 2 38 8.25 | 2.2735 | 14 2 53.8 | 14.014 |
| 3 | 0 55 11.40 | 2.1992 | 2 2 46.5 | 16.042 | 3 | 2 40 24.79 | 2.2779 | 14 16 52.2 | 13.932 |
| 4 | 0 57 19.37 | 2.1936 | 2 18 48.8 | 16.034 | 4 | 2 42 41.60 | 2.2823 | 14 30 45.6 | 13.848 |
| 5 | 0 59 27.43 | 2.1950 | 2 34 50.6 | 16.026 | 5 | 2 44 58.67 | 2.2867 | 14 44 33.9 | 13.763 |
| 6 | 1 1 35.57 | 2.1964 | 2 50 51.9 | 16.016 | 6 | 2 47 16.01 | 2.2913 | 14 58 17.1 | 13.676 |
| 7 | 1 3 43.80 | 2.1980 | 3 6 52.5 | 16.004 | 7 | 2 49 33.63 | 2.2959 | 15 11 55.0 | 13.587 |
| 8 | 1 5 52.13 | 2.1996 | 3 22 52.4 | 15.991 | 8 | 2 51 51.52 | 2.3005 | 15 25 27.5 | 13.496 |
| 9 | 1 8 0.56 | 2.1413 | 3 38 51.4 | 15.976 | 9 | 2 54 9.69 | 2.3052 | 15 38 54.5 | 13.404 |
| 10 | 1 10 9.09 | 2.1432 | 3 54 49.5 | 15.960 | 10 | 2 56 28.14 | 2.3098 | 15 52 16.0 | 13.311 |
| 11 | 1 12 17.74 | 2.1451 | 4 10 46.6 | 15.942 | 11 | 2 58 46.87 | 2.3144 | 16 5 31.8 | 13.215 |
| 12 | 1 14 26.50 | 2.1470 | 4 26 42.5 | 15.922 | 12 | 3 1 5.87 | 2.3191 | 16 18 41.8 | 13.118 |
| 13 | 1 16 35.38 | 2.1491 | 4 42 37.2 | 15.902 | 13 | 3 3 25.16 | 2.3238 | 16 31 46.0 | 13.020 |
| 14 | 1 18 44.39 | 2.1512 | 4 58 30.7 | 15.880 | 14 | 3 5 44.73 | 2.3286 | 16 44 44.2 | 12.919 |
| 15 | 1 20 53.53 | 2.1534 | 5 14 22.8 | 15.856 | 15 | 3 8 4.59 | 2.3333 | 16 57 36.3 | 12.817 |
| 16 | 1 23 2.80 | 2.1557 | 5 30 13.4 | 15.830 | 16 | 3 10 24.73 | 2.3381 | 17 10 22.3 | 12.714 |
| 17 | 1 25 12.21 | 2.1580 | 5 46 2.4 | 15.803 | 17 | 3 12 45.16 | 2.3429 | 17 23 2.0 | 12.609 |
| 18 | 1 27 21.76 | 2.1604 | 6 1 49.8 | 15.775 | 18 | 3 15 5.88 | 2.3477 | 17 35 35.4 | 12.502 |
| 19 | 1 29 31.46 | 2.1629 | 6 17 35.4 | 15.745 | 19 | 3 17 26.88 | 2.3524 | 17 48 2.3 | 12.394 |
| 20 | 1 31 41.31 | 2.1655 | 6 33 19.2 | 15.713 | 20 | 3 19 48.17 | 2.3572 | 18 0 22.7 | 12.286 |
| 21 | 1 33 51.32 | 2.1682 | 6 49 1.0 | 15.680 | 21 | 3 22 9.75 | 2.3621 | 18 12 36.5 | 12.173 |
| 22 | 1 36 1.49 | 2.1709 | 7 4 40.8 | 15.645 | 22 | 3 24 31.62 | 2.3668 | 18 24 43.5 | 12.060 |
| 23 | 1 38 11.83 | 2.1737 | 7 20 18.4 | 15.608 | 23 | 3 26 53.77 | 2.3716 | 18 36 43.7 | 11.945 |
| 24 | 1 40 22.34 | 2.1766 | N. 7° 35' 53.8" | 15.571 | 24 | 3 29 16.21 | 2.3764 | N. 18° 48' 36.9" | 11.828 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|------------|------------------|---------------------|------------------|---------------------|---------------|------------------|---------------------|------------------|---------------------|
| SUNDAY 13. | | | | | TUESDAY 15. | | | | |
| 0 | h m s | s | N. 18° 48' 36.9" | 11.898 | 0 | h m s | s | N. 25° 36' 29.0" | 4.737 |
| 1 | 3 29 16.21 | 2.3764 | 19 0 23.1 | 11.711 | 1 | 5 28 4.24 | 2.5449 | 25 41 8.1 | 4.567 |
| 2 | 3 31 38.94 | 2.3819 | 19 12 2.2 | 11.592 | 2 | 5 30 36.97 | 2.5461 | 25 45 37.1 | 4.398 |
| 3 | 3 34 1.95 | 2.3859 | 19 23 34.2 | 11.472 | 3 | 5 33 9.77 | 2.5471 | 25 49 55.9 | 4.228 |
| 4 | 3 36 25.25 | 2.3907 | 19 34 58.8 | 11.349 | 4 | 5 35 42.62 | 2.5479 | 25 54 4.5 | 4.057 |
| 5 | 3 38 48.83 | 2.3954 | 19 46 16.0 | 11.225 | 5 | 5 38 15.52 | 2.5487 | 25 58 2.8 | 3.886 |
| 6 | 3 41 12.69 | 2.4001 | 19 57 25.8 | 11.100 | 6 | 5 40 48.47 | 2.5494 | 26 1 50.8 | 3.714 |
| 7 | 3 43 36.84 | 2.4048 | 20 8 28.0 | 10.972 | 7 | 5 43 21.45 | 2.5499 | 26 5 28.5 | 3.543 |
| 8 | 3 46 1.27 | 2.4095 | 20 19 22.5 | 10.844 | 8 | 5 45 54.46 | 2.5502 | 26 8 55.9 | 3.373 |
| 9 | 3 48 25.98 | 2.4141 | 20 30 9.3 | 10.715 | 9 | 5 48 27.48 | 2.5504 | 26 12 13.1 | 3.200 |
| 10 | 3 50 50.96 | 2.4187 | 20 40 48.3 | 10.584 | 10 | 5 51 0.51 | 2.5505 | 26 15 19.9 | 3.028 |
| 11 | 3 53 16.22 | 2.4232 | 20 51 19.4 | 10.451 | 11 | 5 53 33.54 | 2.5509 | 26 18 16.4 | 2.856 |
| 12 | 3 55 41.75 | 2.4277 | 21 1 42.4 | 10.316 | 12 | 5 56 6.56 | 2.5509 | 26 21 2.6 | 2.684 |
| 13 | 3 58 7.55 | 2.4322 | 21 11 57.3 | 10.181 | 13 | 5 58 39.57 | 2.5499 | 26 23 38.5 | 2.512 |
| 14 | 4 0 33.62 | 2.4367 | 21 22 4.1 | 10.045 | 14 | 6 1 12.55 | 2.5494 | 26 26 4.0 | 2.339 |
| 15 | 4 2 59.96 | 2.4419 | 21 32 2.7 | 9.907 | 15 | 6 3 45.50 | 2.5487 | 26 28 19.2 | 2.167 |
| 16 | 4 5 26.56 | 2.4455 | 21 41 52.9 | 9.767 | 16 | 6 6 18.40 | 2.5479 | 26 30 24.1 | 1.996 |
| 17 | 4 7 53.42 | 2.4498 | 21 51 34.7 | 9.627 | 17 | 6 8 51.25 | 2.5470 | 26 32 18.7 | 1.824 |
| 18 | 4 10 20.54 | 2.4541 | 22 1 8.1 | 9.485 | 18 | 6 11 24.04 | 2.5460 | 26 34 3.0 | 1.653 |
| 19 | 4 12 47.92 | 2.4584 | 22 10 32.9 | 9.341 | 19 | 6 13 56.77 | 2.5446 | 26 35 37.0 | 1.483 |
| 20 | 4 15 15.55 | 2.4625 | 22 19 49.0 | 9.196 | 20 | 6 16 29.42 | 2.5434 | 26 37 0.8 | 1.311 |
| 21 | 4 17 43.42 | 2.4666 | 22 28 56.4 | 9.050 | 21 | 6 19 1.98 | 2.5419 | 26 38 14.3 | 1.140 |
| 22 | 4 20 11.54 | 2.4707 | 22 37 55.0 | 8.903 | 22 | 6 21 34.45 | 2.5403 | 26 39 17.6 | 0.970 |
| 23 | 4 22 39.90 | 2.4746 | N. 22° 46' 44.8" | 8.756 | 23 | 6 24 6.82 | 2.5386 | N. 26° 40' 10.7" | 0.799 |
| 24 | 4 25 8.49 | 2.4784 | | | | 6 26 39.08 | 2.5366 | | |
| MONDAY 14. | | | | | WEDNESDAY 16. | | | | |
| 0 | 4 27 37.30 | 2.4821 | N. 22° 55' 25.7" | 8.607 | 0 | 6 29 11.21 | 2.5344 | N. 26° 40' 53.5" | 0.629 |
| 1 | 4 30 6.34 | 2.4859 | 23 3 57.6 | 8.456 | 1 | 6 31 43.21 | 2.5322 | 26 41 26.2 | 0.460 |
| 2 | 4 32 35.61 | 2.4897 | 23 12 20.4 | 8.303 | 2 | 6 34 15.08 | 2.5300 | 26 41 48.7 | 0.291 |
| 3 | 4 35 5.10 | 2.4933 | 23 20 34.0 | 8.150 | 3 | 6 36 46.82 | 2.5276 | 26 42 1.1 | + 0.123 |
| 4 | 4 37 34.80 | 2.4967 | 23 28 38.4 | 7.997 | 4 | 6 39 18.40 | 2.5249 | 26 42 3.4 | - 0.045 |
| 5 | 4 40 4.71 | 2.5001 | 23 36 33.6 | 7.842 | 5 | 6 41 49.81 | 2.5221 | 26 41 55.7 | 0.213 |
| 6 | 4 42 34.81 | 2.5034 | 23 44 19.4 | 7.685 | 6 | 6 44 21.05 | 2.5192 | 26 41 37.9 | 0.380 |
| 7 | 4 45 5.11 | 2.5066 | 23 51 55.8 | 7.528 | 7 | 6 46 52.12 | 2.5163 | 26 41 10.1 | 0.546 |
| 8 | 4 47 35.60 | 2.5097 | 23 59 22.8 | 7.371 | 8 | 6 49 23.00 | 2.5131 | 26 40 32.4 | 0.711 |
| 9 | 4 50 6.28 | 2.5128 | 24 6 40.3 | 7.212 | 9 | 6 51 53.69 | 2.5099 | 26 39 44.8 | 0.876 |
| 10 | 4 52 37.14 | 2.5157 | 24 13 48.2 | 7.052 | 10 | 6 54 24.19 | 2.5065 | 26 38 47.3 | 1.040 |
| 11 | 4 55 8.17 | 2.5185 | 24 20 46.5 | 6.899 | 11 | 6 56 54.47 | 2.5029 | 26 37 40.0 | 1.204 |
| 12 | 4 57 39.36 | 2.5212 | 24 27 35.2 | 6.731 | 12 | 6 59 24.53 | 2.4992 | 26 36 22.8 | 1.367 |
| 13 | 5 0 10.71 | 2.5238 | 24 34 14.2 | 6.568 | 13 | 7 1 54.27 | 2.4955 | 26 34 55.9 | 1.529 |
| 14 | 5 2 42.22 | 2.5264 | 24 40 43.4 | 6.404 | 14 | 7 4 23.99 | 2.4917 | 26 33 19.3 | 1.690 |
| 15 | 5 5 13.88 | 2.5288 | 24 47 2.7 | 6.240 | 15 | 7 6 53.37 | 2.4876 | 26 31 33.1 | 1.851 |
| 16 | 5 7 45.68 | 2.5311 | 24 53 12.2 | 6.076 | 16 | 7 9 22.50 | 2.4834 | 26 29 37.2 | 2.011 |
| 17 | 5 10 17.61 | 2.5333 | 24 59 11.8 | 5.911 | 17 | 7 11 51.38 | 2.4792 | 26 27 31.8 | 2.169 |
| 18 | 5 12 49.67 | 2.5353 | 25 5 1.5 | 5.745 | 18 | 7 14 20.00 | 2.4748 | 26 25 16.9 | 2.327 |
| 19 | 5 15 21.85 | 2.5372 | 25 10 41.2 | 5.578 | 19 | 7 16 48.35 | 2.4703 | 26 22 52.6 | 2.484 |
| 20 | 5 17 54.14 | 2.5390 | 25 16 10.9 | 5.411 | 20 | 7 19 16.44 | 2.4658 | 26 20 18.8 | 2.641 |
| 21 | 5 20 26.53 | 2.5406 | 25 21 30.6 | 5.244 | 21 | 7 21 44.25 | 2.4612 | 26 17 35.7 | 2.795 |
| 22 | 5 22 59.01 | 2.5421 | 25 26 40.2 | 5.076 | 22 | 7 24 11.78 | 2.4563 | 26 14 43.4 | 2.949 |
| 23 | 5 25 31.58 | 2.5436 | 25 31 39.7 | 4.907 | 23 | 7 26 39.01 | 2.4513 | 26 11 41.9 | 3.102 |
| 24 | 5 28 4.24 | 2.5449 | N. 25° 36' 29.0" | 4.737 | 24 | 7 29 5.94 | 2.4463 | N. 26° 8' 31.2" | 3.254 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|--|---------------------|-----------------|---------------------|--------------|---|---------------------|------------------|---------------------|
| THURSDAY 17. | | | | | SATURDAY 19. | | | | |
| 0 | ^b 7 29 5.94 ^m ^s | 2.4463 | N. 26° 8' 31.2" | 3.954 | 0 | ^b 9 19 32.80 ^m ^s | 2.1439 | N. 20° 59' 52.9" | 9.114 |
| 1 | 7 31 32.57 | 2.4413 | 26 5 11.4 | 3.405 | 1 | 9 21 41.19 | 2.1365 | 20 50 43.3 | 9.905 |
| 2 | 7 33 58.90 | 2.4361 | 26 1 42.6 | 3.554 | 2 | 9 23 49.18 | 2.1298 | 20 41 28.3 | 9.994 |
| 3 | 7 36 24.91 | 2.4308 | 25 58 4.9 | 3.703 | 3 | 9 25 56.77 | 2.1232 | 20 32 8.0 | 9.982 |
| 4 | 7 38 50.60 | 2.4255 | 25 54 18.3 | 3.851 | 4 | 9 28 3.97 | 2.1167 | 20 22 42.4 | 9.460 |
| 5 | 7 41 15.97 | 2.4202 | 25 50 22.8 | 3.998 | 5 | 9 30 10.78 | 2.1103 | 20 13 11.7 | 9.554 |
| 6 | 7 43 41.02 | 2.4147 | 25 46 18.5 | 4.144 | 6 | 9 32 17.21 | 2.1039 | 20 3 35.9 | 9.638 |
| 7 | 7 46 5.73 | 2.4090 | 25 42 5.5 | 4.287 | 7 | 9 34 23.25 | 2.0974 | 19 53 55.1 | 9.722 |
| 8 | 7 48 30.10 | 2.4032 | 25 37 44.0 | 4.430 | 8 | 9 36 28.90 | 2.0909 | 19 44 9.3 | 9.804 |
| 9 | 7 50 54.12 | 2.3975 | 25 33 13.9 | 4.573 | 9 | 9 38 34.16 | 2.0845 | 19 34 18.6 | 9.885 |
| 10 | 7 53 17.80 | 2.3917 | 25 28 35.3 | 4.713 | 10 | 9 40 39.04 | 2.0782 | 19 24 23.1 | 9.964 |
| 11 | 7 55 41.12 | 2.3858 | 25 23 48.3 | 4.853 | 11 | 9 42 43.55 | 2.0720 | 19 14 22.9 | 10.042 |
| 12 | 7 58 4.09 | 2.3798 | 25 18 52.9 | 4.992 | 12 | 9 44 47.68 | 2.0657 | 19 4 18.1 | 10.119 |
| 13 | 8 0 26.70 | 2.3738 | 25 13 49.3 | 5.129 | 13 | 9 46 51.43 | 2.0594 | 18 54 8.7 | 10.195 |
| 14 | 8 2 48.94 | 2.3677 | 25 8 37.5 | 5.265 | 14 | 9 48 54.81 | 2.0533 | 18 43 54.7 | 10.270 |
| 15 | 8 5 10.82 | 2.3616 | 25 3 17.5 | 5.400 | 15 | 9 50 57.83 | 2.0472 | 18 33 36.3 | 10.343 |
| 16 | 8 7 32.33 | 2.3554 | 24 57 49.5 | 5.533 | 16 | 9 53 0.48 | 2.0412 | 18 23 13.5 | 10.418 |
| 17 | 8 9 53.46 | 2.3491 | 24 52 13.6 | 5.665 | 17 | 9 55 2.77 | 2.0352 | 18 12 46.4 | 10.467 |
| 18 | 8 12 14.22 | 2.3428 | 24 46 29.7 | 5.797 | 18 | 9 57 4.70 | 2.0292 | 18 2 15.1 | 10.557 |
| 19 | 8 14 34.60 | 2.3364 | 24 40 38.0 | 5.926 | 19 | 9 59 6.27 | 2.0232 | 17 51 39.6 | 10.626 |
| 20 | 8 16 54.59 | 2.3300 | 24 34 38.6 | 6.053 | 20 | 10 1 7.49 | 2.0173 | 17 41 0.0 | 10.694 |
| 21 | 8 19 14.20 | 2.3237 | 24 28 31.6 | 6.180 | 21 | 10 3 8.35 | 2.0114 | 17 30 16.3 | 10.762 |
| 22 | 8 21 33.43 | 2.3173 | 24 22 17.0 | 6.307 | 22 | 10 5 8.86 | 2.0057 | 17 19 28.6 | 10.828 |
| 23 | 8 23 52.26 | 2.3106 | N. 24 15 54.8 | 6.433 | 23 | 10 7 9.03 | 2.0000 | N. 17 8 37.0 | 10.892 |
| FRIDAY 18. | | | | | SUNDAY 20. | | | | |
| 0 | 8 26 10.70 | 2.3041 | N. 24 9 25.2 | 6.554 | 0 | 10 9 8.86 | 1.9943 | N. 16 57 41.6 | 10.955 |
| 1 | 8 28 28.75 | 2.2975 | 24 2 48.3 | 6.676 | 1 | 10 11 8.35 | 1.9887 | 16 46 42.4 | 11.017 |
| 2 | 8 30 46.40 | 2.2908 | 23 56 4.1 | 6.797 | 2 | 10 13 7.51 | 1.9831 | 16 35 39.5 | 11.079 |
| 3 | 8 33 3.65 | 2.2842 | 23 49 12.7 | 6.916 | 3 | 10 15 6.33 | 1.9776 | 16 24 32.9 | 11.140 |
| 4 | 8 35 20.50 | 2.2775 | 23 42 14.2 | 7.033 | 4 | 10 17 4.82 | 1.9722 | 16 13 22.7 | 11.199 |
| 5 | 8 37 36.95 | 2.2709 | 23 35 8.7 | 7.150 | 5 | 10 19 2.99 | 1.9668 | 16 2 9.0 | 11.257 |
| 6 | 8 39 53.01 | 2.2642 | 23 27 56.2 | 7.265 | 6 | 10 21 0.84 | 1.9615 | 15 50 51.8 | 11.315 |
| 7 | 8 42 8.66 | 2.2575 | 23 20 36.9 | 7.378 | 7 | 10 22 58.37 | 1.9562 | 15 39 31.2 | 11.371 |
| 8 | 8 44 23.91 | 2.2507 | 23 13 10.8 | 7.491 | 8 | 10 24 55.59 | 1.9510 | 15 28 7.3 | 11.426 |
| 9 | 8 46 38.75 | 2.2440 | 23 5 37.9 | 7.603 | 9 | 10 26 52.49 | 1.9458 | 15 16 40.1 | 11.481 |
| 10 | 8 48 53.19 | 2.2372 | 22 57 58.4 | 7.713 | 10 | 10 28 49.09 | 1.9407 | 15 5 9.6 | 11.535 |
| 11 | 8 51 7.22 | 2.2304 | 22 50 12.3 | 7.822 | 11 | 10 30 45.38 | 1.9357 | 14 53 35.9 | 11.587 |
| 12 | 8 53 20.84 | 2.2237 | 22 42 19.8 | 7.928 | 12 | 10 32 41.37 | 1.9308 | 14 41 59.1 | 11.638 |
| 13 | 8 55 34.06 | 2.2169 | 22 34 20.9 | 8.034 | 13 | 10 34 37.07 | 1.9259 | 14 30 19.3 | 11.688 |
| 14 | 8 57 46.87 | 2.2102 | 22 26 15.7 | 8.139 | 14 | 10 36 32.48 | 1.9210 | 14 18 36.5 | 11.738 |
| 15 | 8 59 59.28 | 2.2034 | 22 18 4.2 | 8.242 | 15 | 10 38 27.59 | 1.9162 | 14 6 50.7 | 11.787 |
| 16 | 9 2 11.28 | 2.1967 | 22 9 46.6 | 8.344 | 16 | 10 40 22.42 | 1.9116 | 13 55 2.0 | 11.836 |
| 17 | 9 4 22.88 | 2.1900 | 22 1 22.9 | 8.446 | 17 | 10 42 16.98 | 1.9070 | 13 43 10.5 | 11.881 |
| 18 | 9 6 34.08 | 2.1832 | 21 52 53.1 | 8.546 | 18 | 10 44 11.26 | 1.9024 | 13 31 16.3 | 11.927 |
| 19 | 9 8 44.87 | 2.1765 | 21 44 17.4 | 8.643 | 19 | 10 46 5.26 | 1.8978 | 13 19 19.3 | 11.972 |
| 20 | 9 10 55.26 | 2.1698 | 21 35 35.9 | 8.740 | 20 | 10 47 59.00 | 1.8935 | 13 7 19.6 | 12.017 |
| 21 | 9 13 5.25 | 2.1631 | 21 26 48.6 | 8.836 | 21 | 10 49 52.48 | 1.8892 | 12 55 17.3 | 12.060 |
| 22 | 9 15 14.83 | 2.1564 | 21 17 55.6 | 8.930 | 22 | 10 51 45.70 | 1.8849 | 12 43 12.4 | 12.102 |
| 23 | 9 17 24.01 | 2.1498 | 21 8 57.0 | 9.022 | 23 | 10 53 38.66 | 1.8806 | 12 31 5.0 | 12.143 |
| 24 | 9 19 32.80 | 2.1432 | N. 20 59 52.9 | 9.114 | 24 | 10 55 31.37 | 1.8764 | N. 12 18 55.2 | 12.183 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|-------------|------------------|---------------------|---------------|---------------------|---------------|------------------|---------------------|--------------|---------------------|
| MONDAY 21. | | | | | WEDNESDAY 23. | | | | |
| 0 | 10 55 31.37 | 1.8764 | N. 12 18 55.2 | 19.183 | 0 | 12 22 10.49 | 1.7625 | N. 2 1 50.2 | 13.260 |
| 1 | 10 57 23.83 | 1.8793 | 12 6 43.0 | 19.223 | 1 | 12 23 56.22 | 1.7690 | 1 48 34.4 | 13.266 |
| 2 | 10 59 16.05 | 1.8863 | 11 54 28.4 | 19.263 | 2 | 12 25 41.93 | 1.7616 | 1 35 18.3 | 13.271 |
| 3 | 11 1 8.03 | 1.8643 | 11 42 11.4 | 19.303 | 3 | 12 27 27.61 | 1.7613 | 1 22 1.9 | 13.276 |
| 4 | 11 2 59.77 | 1.8604 | 11 29 52.2 | 19.339 | 4 | 12 29 13.27 | 1.7608 | 1 8 45.2 | 13.280 |
| 5 | 11 4 51.28 | 1.8567 | 11 17 30.8 | 19.375 | 5 | 12 30 58.91 | 1.7605 | 0 55 28.3 | 13.284 |
| 6 | 11 6 42.57 | 1.8530 | 11 5 7.2 | 19.411 | 6 | 12 32 44.53 | 1.7604 | 0 42 11.1 | 13.287 |
| 7 | 11 8 33.64 | 1.8493 | 10 52 41.5 | 19.446 | 7 | 12 34 30.15 | 1.7603 | 0 28 53.8 | 13.289 |
| 8 | 11 10 24.49 | 1.8457 | 10 40 13.7 | 19.479 | 8 | 12 36 15.77 | 1.7602 | 0 15 36.4 | 13.291 |
| 9 | 11 12 15.12 | 1.8421 | 10 27 44.0 | 19.519 | 9 | 12 38 1.38 | 1.7602 | N. 0 2 18.9 | 13.292 |
| 10 | 11 14 5.51 | 1.8387 | 10 15 12.3 | 19.545 | 10 | 12 39 47.00 | 1.7604 | S. 0 10 58.7 | 13.293 |
| 11 | 11 15 55.76 | 1.8354 | 10 2 38.6 | 19.577 | 11 | 12 41 32.63 | 1.7607 | 0 24 16.3 | 13.299 |
| 12 | 11 17 45.79 | 1.8322 | 9 50 3.0 | 19.608 | 12 | 12 43 18.28 | 1.7610 | 0 37 33.8 | 13.299 |
| 13 | 11 19 35.02 | 1.8289 | 9 37 25.6 | 19.638 | 13 | 12 45 3.95 | 1.7613 | 0 50 51.3 | 13.291 |
| 14 | 11 21 25.26 | 1.8257 | 9 24 46.4 | 19.667 | 14 | 12 46 49.64 | 1.7617 | 1 4 8.7 | 13.289 |
| 15 | 11 23 14.70 | 1.8225 | 9 12 5.5 | 19.696 | 15 | 12 48 35.36 | 1.7622 | 1 17 26.0 | 13.287 |
| 16 | 11 25 3.96 | 1.8196 | 8 59 22.9 | 19.724 | 16 | 12 50 21.11 | 1.7628 | 1 30 43.1 | 13.283 |
| 17 | 11 26 53.05 | 1.8167 | 8 46 38.6 | 19.752 | 17 | 12 52 6.90 | 1.7635 | 1 44 0.0 | 13.279 |
| 18 | 11 28 41.96 | 1.8138 | 8 33 52.6 | 19.779 | 18 | 12 53 52.73 | 1.7642 | 1 57 16.6 | 13.274 |
| 19 | 11 30 30.70 | 1.8110 | 8 21 5.1 | 19.804 | 19 | 12 55 38.60 | 1.7650 | 2 10 32.9 | 13.269 |
| 20 | 11 32 19.28 | 1.8083 | 8 8 16.1 | 19.829 | 20 | 12 57 24.53 | 1.7659 | 2 23 48.9 | 13.264 |
| 21 | 11 34 7.69 | 1.8056 | 7 55 25.6 | 19.853 | 21 | 12 59 10.51 | 1.7668 | 2 37 4.6 | 13.258 |
| 22 | 11 35 55.95 | 1.8031 | 7 42 33.7 | 19.877 | 22 | 13 0 56.55 | 1.7679 | 2 50 19.9 | 13.251 |
| 23 | 11 37 44.06 | 1.8006 | N. 7 29 40.4 | 19.900 | 23 | 13 2 42.06 | 1.7690 | S. 3 3 34.7 | 13.244 |
| TUESDAY 22. | | | | | THURSDAY 24. | | | | |
| 0 | 11 39 32.02 | 1.7982 | N. 7 16 45.7 | 19.922 | 0 | 13 4 28.83 | 1.7701 | S. 3 16 49.1 | 13.236 |
| 1 | 11 41 19.84 | 1.7958 | 7 3 49.7 | 19.944 | 1 | 13 6 15.07 | 1.7713 | 3 30 3.0 | 13.227 |
| 2 | 11 43 7.52 | 1.7935 | 6 50 52.4 | 19.965 | 2 | 13 8 1.39 | 1.7727 | 3 43 16.3 | 13.217 |
| 3 | 11 44 55.06 | 1.7913 | 6 37 53.9 | 19.985 | 3 | 13 9 47.80 | 1.7742 | 3 56 29.0 | 13.207 |
| 4 | 11 46 42.47 | 1.7892 | 6 24 54.2 | 13.004 | 4 | 13 11 34.29 | 1.7757 | 4 9 41.1 | 13.196 |
| 5 | 11 48 29.76 | 1.7873 | 6 11 53.4 | 13.023 | 5 | 13 13 20.88 | 1.7772 | 4 22 52.5 | 13.184 |
| 6 | 11 50 16.93 | 1.7853 | 5 58 51.4 | 13.042 | 6 | 13 15 7.56 | 1.7788 | 4 36 3.2 | 13.172 |
| 7 | 11 52 3.99 | 1.7833 | 5 45 48.3 | 13.059 | 7 | 13 16 54.34 | 1.7806 | 4 49 13.2 | 13.160 |
| 8 | 11 53 50.93 | 1.7814 | 5 32 44.3 | 13.075 | 8 | 13 18 41.23 | 1.7824 | 5 2 22.4 | 13.147 |
| 9 | 11 55 37.76 | 1.7797 | 5 19 39.3 | 13.092 | 9 | 13 20 28.22 | 1.7842 | 5 15 30.8 | 13.133 |
| 10 | 11 57 24.49 | 1.7781 | 5 6 33.3 | 13.108 | 10 | 13 22 15.33 | 1.7861 | 5 28 38.3 | 13.118 |
| 11 | 11 59 11.13 | 1.7765 | 4 53 26.4 | 13.123 | 11 | 13 24 2.56 | 1.7881 | 5 41 44.9 | 13.102 |
| 12 | 12 0 57.67 | 1.7749 | 4 40 18.5 | 13.138 | 12 | 13 25 49.90 | 1.7901 | 5 54 50.5 | 13.085 |
| 13 | 12 2 44.12 | 1.7735 | 4 27 9.8 | 13.151 | 13 | 13 27 37.37 | 1.7923 | 6 7 55.1 | 13.068 |
| 14 | 12 4 30.49 | 1.7721 | 4 14 0.4 | 13.164 | 14 | 13 29 24.98 | 1.7946 | 6 20 58.7 | 13.051 |
| 15 | 12 6 16.78 | 1.7708 | 4 0 50.2 | 13.176 | 15 | 13 31 12.72 | 1.7968 | 6 34 1.3 | 13.034 |
| 16 | 12 8 2.99 | 1.7696 | 3 47 39.3 | 13.188 | 16 | 13 33 0.60 | 1.7992 | 6 47 2.8 | 13.015 |
| 17 | 12 9 49.13 | 1.7684 | 3 34 27.7 | 13.199 | 17 | 13 34 48.63 | 1.8017 | 7 0 3.1 | 12.994 |
| 18 | 12 11 35.20 | 1.7673 | 3 21 15.4 | 13.210 | 18 | 13 36 36.80 | 1.8042 | 7 13 2.1 | 12.973 |
| 19 | 12 13 21.21 | 1.7663 | 3 8 2.5 | 13.219 | 19 | 13 38 25.13 | 1.8068 | 7 25 59.9 | 12.953 |
| 20 | 12 15 7.16 | 1.7654 | 2 54 49.1 | 13.228 | 20 | 13 40 13.62 | 1.8094 | 7 38 50.4 | 12.933 |
| 21 | 12 16 53.06 | 1.7646 | 2 41 35.1 | 13.237 | 21 | 13 42 2.26 | 1.8121 | 7 51 51.7 | 12.910 |
| 22 | 12 18 38.91 | 1.7638 | 2 28 20.6 | 13.246 | 22 | 13 43 51.07 | 1.8149 | 8 4 45.6 | 12.886 |
| 23 | 12 20 24.72 | 1.7631 | 2 15 5.6 | 13.253 | 23 | 13 45 40.05 | 1.8178 | 8 17 38.0 | 12.862 |
| 24 | 12 22 10.49 | 1.7625 | N. 2 1 50.2 | 13.260 | 24 | 13 47 29.24 | 1.8208 | S. 8 30 29.0 | 12.837 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|--------------|------------------|------------------------|---------------|------------------------|------------|------------------|------------------------|---------------|------------------------|
| FRIDAY 25. | | | | | SUNDAY 27. | | | | |
| 0 | 13 47 29.21 | 1.8208 | S. 8 30 20.0 | 12.837 | 0 | 15 19 35.99 | 2.0415 | S. 18 2 4.3 | 10.615 |
| 1 | 13 49 18.55 | 1.8338 | 8 43 18.5 | 12.812 | 1 | 15 21 38.66 | 2.0475 | 18 12 39.1 | 10.544 |
| 2 | 13 51 8.07 | 1.8360 | 8 56 6.4 | 12.785 | 2 | 15 23 41.69 | 2.0536 | 18 23 9.6 | 10.472 |
| 3 | 13 52 57.78 | 1.8301 | 9 8 52.7 | 12.758 | 3 | 15 25 45.09 | 2.0597 | 18 33 35.7 | 10.398 |
| 4 | 13 54 47.68 | 1.8333 | 9 21 37.4 | 12.730 | 4 | 15 27 48.85 | 2.0658 | 18 43 57.3 | 10.322 |
| 5 | 13 56 37.78 | 1.8366 | 9 34 20.3 | 12.701 | 5 | 15 29 52.98 | 2.0719 | 18 54 14.3 | 10.245 |
| 6 | 13 58 28.08 | 1.8400 | 9 47 1.5 | 12.672 | 6 | 15 31 57.48 | 2.0782 | 19 4 26.7 | 10.168 |
| 7 | 14 0 18.58 | 1.8435 | 9 59 41.0 | 12.643 | 7 | 15 34 2.36 | 2.0844 | 19 14 34.5 | 10.090 |
| 8 | 14 2 9.30 | 1.8471 | 10 12 18.6 | 12.611 | 8 | 15 36 7.61 | 2.0907 | 19 24 37.5 | 10.010 |
| 9 | 14 4 0.23 | 1.8507 | 10 24 51.3 | 12.579 | 9 | 15 38 13.24 | 2.0970 | 19 34 35.7 | 9.929 |
| 10 | 14 5 51.38 | 1.8543 | 10 37 28.1 | 12.547 | 10 | 15 40 19.25 | 2.1033 | 19 44 29.0 | 9.847 |
| 11 | 14 7 42.75 | 1.8580 | 10 49 59.9 | 12.513 | 11 | 15 42 25.64 | 2.1097 | 19 54 17.4 | 9.764 |
| 12 | 14 9 34.34 | 1.8618 | 11 2 20.6 | 12.478 | 12 | 15 44 32.41 | 2.1161 | 20 4 0.7 | 9.679 |
| 13 | 14 11 26.17 | 1.8657 | 11 14 57.2 | 12.443 | 13 | 15 46 39.57 | 2.1226 | 20 13 38.9 | 9.593 |
| 14 | 14 13 18.23 | 1.8697 | 11 27 22.8 | 12.408 | 14 | 15 48 47.12 | 2.1290 | 20 23 11.9 | 9.507 |
| 15 | 14 15 10.53 | 1.8737 | 11 39 46.2 | 12.371 | 15 | 15 50 55.05 | 2.1354 | 20 32 39.7 | 9.418 |
| 16 | 14 17 3.08 | 1.8778 | 11 52 7.3 | 12.333 | 16 | 15 53 3.37 | 2.1419 | 20 42 2.1 | 9.328 |
| 17 | 14 18 55.87 | 1.8819 | 12 4 26.1 | 12.294 | 17 | 15 55 12.08 | 2.1485 | 20 51 19.1 | 9.237 |
| 18 | 14 20 48.91 | 1.8863 | 12 16 42.6 | 12.255 | 18 | 15 57 21.19 | 2.1551 | 21 0 30.5 | 9.144 |
| 19 | 14 22 42.21 | 1.8905 | 12 28 56.7 | 12.214 | 19 | 15 59 30.69 | 2.1616 | 21 9 36.4 | 9.051 |
| 20 | 14 24 35.77 | 1.8948 | 12 41 8.3 | 12.173 | 20 | 16 1 40.58 | 2.1682 | 21 18 36.7 | 8.957 |
| 21 | 14 26 29.59 | 1.8992 | 12 53 17.5 | 12.131 | 21 | 16 3 50.87 | 2.1747 | 21 27 31.2 | 8.860 |
| 22 | 14 28 23.67 | 1.9037 | 13 5 24.1 | 12.087 | 22 | 16 6 1.55 | 2.1813 | 21 36 19.9 | 8.769 |
| 23 | 14 30 18.03 | 1.9083 | S. 13 17 28.0 | 12.043 | 23 | 16 8 12.63 | 2.1879 | S. 21 45 2.7 | 8.684 |
| SATURDAY 26. | | | | | MONDAY 28. | | | | |
| 0 | 14 32 12.67 | 1.9130 | S. 13 29 29.3 | 11.999 | 0 | 16 10 24.10 | 2.1945 | S. 21 53 39.6 | 8.564 |
| 1 | 14 34 7.59 | 1.9177 | 13 41 27.9 | 11.953 | 1 | 16 12 35.97 | 2.2011 | 22 2 10.4 | 8.469 |
| 2 | 14 36 2.79 | 1.9224 | 13 53 23.7 | 11.906 | 2 | 16 14 48.24 | 2.2077 | 22 10 35.1 | 8.360 |
| 3 | 14 37 58.27 | 1.9271 | 14 5 16.6 | 11.858 | 3 | 16 17 0.90 | 2.2143 | 22 18 53.6 | 8.256 |
| 4 | 14 39 54.04 | 1.9320 | 14 17 6.6 | 11.809 | 4 | 16 19 13.96 | 2.2209 | 22 27 5.8 | 8.151 |
| 5 | 14 41 50.11 | 1.9370 | 14 28 53.7 | 11.760 | 5 | 16 21 27.41 | 2.2275 | 22 35 11.7 | 8.044 |
| 6 | 14 43 46.48 | 1.9420 | 14 40 37.8 | 11.709 | 6 | 16 23 41.26 | 2.2341 | 22 43 11.1 | 7.936 |
| 7 | 14 45 43.15 | 1.9471 | 14 52 18.8 | 11.657 | 7 | 16 25 55.51 | 2.2407 | 22 51 4.0 | 7.827 |
| 8 | 14 47 40.13 | 1.9522 | 15 3 56.7 | 11.604 | 8 | 16 28 10.15 | 2.2472 | 22 58 50.3 | 7.716 |
| 9 | 14 49 37.41 | 1.9573 | 15 15 31.3 | 11.550 | 9 | 16 30 25.18 | 2.2538 | 23 6 29.9 | 7.604 |
| 10 | 14 51 35.00 | 1.9625 | 15 27 2.7 | 11.496 | 10 | 16 32 40.61 | 2.2604 | 23 14 2.8 | 7.492 |
| 11 | 14 53 32.91 | 1.9678 | 15 38 39.8 | 11.440 | 11 | 16 34 56.43 | 2.2669 | 23 21 28.9 | 7.377 |
| 12 | 14 55 31.14 | 1.9732 | 15 49 55.5 | 11.383 | 12 | 16 37 12.64 | 2.2734 | 23 28 48.0 | 7.260 |
| 13 | 14 57 29.69 | 1.9786 | 16 1 16.7 | 11.325 | 13 | 16 39 29.24 | 2.2799 | 23 36 0.1 | 7.143 |
| 14 | 14 59 28.57 | 1.9841 | 16 12 34.5 | 11.267 | 14 | 16 41 46.23 | 2.2863 | 23 43 5.2 | 7.025 |
| 15 | 15 1 27.78 | 1.9896 | 16 23 48.7 | 11.206 | 15 | 16 44 3.60 | 2.2927 | 23 50 3.1 | 6.905 |
| 16 | 15 3 27.32 | 1.9953 | 16 34 59.2 | 11.144 | 16 | 16 46 21.35 | 2.2991 | 23 56 53.8 | 6.784 |
| 17 | 15 5 27.20 | 2.0008 | 16 46 6.0 | 11.082 | 17 | 16 48 39.49 | 2.3055 | 24 3 37.2 | 6.662 |
| 18 | 15 7 27.41 | 2.0064 | 16 57 9.0 | 11.018 | 18 | 16 50 58.01 | 2.3118 | 24 10 13.2 | 6.538 |
| 19 | 15 9 27.97 | 2.0121 | 17 8 8.2 | 10.954 | 19 | 16 53 16.90 | 2.3180 | 24 16 41.7 | 6.413 |
| 20 | 15 11 28.87 | 2.0179 | 17 19 3.5 | 10.888 | 20 | 16 55 36.17 | 2.3243 | 24 23 2.7 | 6.287 |
| 21 | 15 13 30.12 | 2.0238 | 17 29 54.8 | 10.822 | 21 | 16 57 55.82 | 2.3306 | 24 29 16.1 | 6.159 |
| 22 | 15 15 31.72 | 2.0297 | 17 40 42.1 | 10.754 | 22 | 17 0 15.84 | 2.3367 | 24 35 21.8 | 6.031 |
| 23 | 15 17 33.68 | 2.0356 | 17 51 25.3 | 10.685 | 23 | 17 2 36.22 | 2.3427 | 24 41 19.8 | 5.901 |
| 24 | 15 19 35.99 | 2.0415 | S. 18 2 4.3 | 10.615 | 24 | 17 4 56.97 | 2.3488 | S. 24 47 9.9 | 5.769 |

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

| Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. | Hour. | Right Ascension. | Diff. for 1 Minute. | Declination. | Diff. for 1 Minute. |
|---------------|------------------|---------------------|------------------|---------------------|--------------------------|------------------|---------------------|------------------|---------------------|
| TUESDAY 29. | | | | | THURSDAY 31. | | | | |
| 0 | 17 4 56.97 | 2.3488 | S. 24° 47' 9.9" | 5.769 | 0 | 19 3 2.34 | 2.5288 | S. 26° 32' 43.5" | 1.676 |
| 1 | 17 7 18.08 | 2.3548 | 24 52 52.1 | 5.837 | 1 | 19 5 34.09 | 2.5295 | 26 30 57.9 | 1.845 |
| 2 | 17 9 39.55 | 2.3607 | 24 58 26.3 | 5.503 | 2 | 19 8 5.88 | 2.5301 | 26 29 2.1 | 2.014 |
| 3 | 17 12 1.37 | 2.3666 | 25 3 52.4 | 5.368 | 3 | 19 10 37.70 | 2.5305 | 26 26 56.2 | 2.183 |
| 4 | 17 14 23.54 | 2.3724 | 25 9 10.4 | 5.232 | 4 | 19 13 9.54 | 2.5308 | 26 24 40.1 | 2.352 |
| 5 | 17 16 46.05 | 2.3781 | 25 14 20.2 | 5.094 | 5 | 19 15 41.40 | 2.5310 | 26 22 13.9 | 2.521 |
| 6 | 17 19 8.91 | 2.3838 | 25 19 21.7 | 4.956 | 6 | 19 18 13.26 | 2.5309 | 26 19 37.6 | 2.690 |
| 7 | 17 21 32.11 | 2.3894 | 25 24 14.9 | 4.816 | 7 | 19 20 45.11 | 2.5308 | 26 16 51.1 | 2.859 |
| 8 | 17 23 55.64 | 2.3948 | 25 28 59.6 | 4.674 | 8 | 19 23 16.96 | 2.5306 | 26 13 54.5 | 3.027 |
| 9 | 17 26 19.49 | 2.4002 | 25 33 35.8 | 4.532 | 9 | 19 25 48.79 | 2.5302 | 26 10 47.8 | 3.196 |
| 10 | 17 28 43.67 | 2.4056 | 25 38 3.5 | 4.390 | 10 | 19 28 20.59 | 2.5297 | 26 7 31.0 | 3.365 |
| 11 | 17 31 8.17 | 2.4110 | 25 42 22.6 | 4.248 | 11 | 19 30 52.36 | 2.5291 | 26 4 4.0 | 3.534 |
| 12 | 17 33 32.99 | 2.4162 | 25 46 32.9 | 4.099 | 12 | 19 33 24.08 | 2.5282 | 26 0 26.9 | 3.702 |
| 13 | 17 35 58.12 | 2.4213 | 25 50 34.5 | 3.953 | 13 | 19 35 55.75 | 2.5273 | 25 56 30.8 | 3.869 |
| 14 | 17 38 23.55 | 2.4263 | 25 54 27.3 | 3.807 | 14 | 19 38 27.36 | 2.5262 | 25 52 42.6 | 4.036 |
| 15 | 17 40 49.27 | 2.4312 | 25 58 11.3 | 3.658 | 15 | 19 40 58.90 | 2.5251 | 25 48 35.4 | 4.203 |
| 16 | 17 43 15.29 | 2.4361 | 26 1 46.3 | 3.508 | 16 | 19 43 30.37 | 2.5238 | 25 44 18.2 | 4.370 |
| 17 | 17 45 41.60 | 2.4408 | 26 5 12.2 | 3.357 | 17 | 19 46 1.75 | 2.5223 | 25 39 51.0 | 4.536 |
| 18 | 17 48 8.19 | 2.4454 | 26 8 20.1 | 3.206 | 18 | 19 48 33.04 | 2.5206 | 25 35 13.9 | 4.701 |
| 19 | 17 50 35.05 | 2.4499 | 26 11 36.9 | 3.053 | 19 | 19 51 4.23 | 2.5189 | 25 30 26.9 | 4.867 |
| 20 | 17 53 2.18 | 2.4544 | 26 14 35.5 | 2.899 | 20 | 19 53 35.31 | 2.5179 | 25 25 29.9 | 5.032 |
| 21 | 17 55 29.58 | 2.4587 | 26 17 24.8 | 2.744 | 21 | 19 56 6.29 | 2.5153 | 25 20 23.0 | 5.196 |
| 22 | 17 57 57.23 | 2.4629 | 26 20 4.8 | 2.589 | 22 | 19 58 37.15 | 2.5133 | 25 15 6.3 | 5.359 |
| 23 | 18 0 25.13 | 2.4671 | S. 26° 22' 35.5" | 2.434 | 23 | 20 1 7.88 | 2.5110 | S. 25° 9' 39.9" | 5.522 |
| WEDNESDAY 30. | | | | | FRIDAY, JANUARY 1, 1892. | | | | |
| 0 | 18 2 53.28 | 2.4711 | S. 26° 24' 56.9" | 2.277 | 0 | 20 3 38.47 | 2.5087 | S. 25° 4' 3.7" | 5.684 |
| 1 | 18 5 21.66 | 2.4749 | 26 27 8.8 | 2.119 | | | | | |
| 2 | 18 7 50.27 | 2.4787 | 26 29 11.2 | 1.960 | | | | | |
| 3 | 18 10 19.10 | 2.4823 | 26 31 4.0 | 1.800 | | | | | |
| 4 | 18 12 48.15 | 2.4858 | 26 32 47.2 | 1.640 | | | | | |
| 5 | 18 15 17.40 | 2.4892 | 26 34 20.8 | 1.480 | | | | | |
| 6 | 18 17 46.85 | 2.4925 | 26 35 44.8 | 1.318 | | | | | |
| 7 | 18 20 16.50 | 2.4957 | 26 36 59.0 | 1.156 | | | | | |
| 8 | 18 22 46.33 | 2.4987 | 26 38 3.5 | 0.993 | | | | | |
| 9 | 18 25 16.34 | 2.5016 | 26 38 58.2 | 0.830 | | | | | |
| 10 | 18 27 46.52 | 2.5043 | 26 39 43.1 | 0.666 | | | | | |
| 11 | 18 30 16.86 | 2.5069 | 26 40 18.1 | 0.501 | | | | | |
| 12 | 18 32 47.35 | 2.5094 | 26 40 43.2 | 0.336 | | | | | |
| 13 | 18 35 17.99 | 2.5118 | 26 40 58.4 | 0.170 | | | | | |
| 14 | 18 37 48.77 | 2.5141 | 26 41 3.6 | - 0.004 | | | | | |
| 15 | 18 40 19.68 | 2.5162 | 26 40 58.9 | + 0.162 | | | | | |
| 16 | 18 42 50.71 | 2.5181 | 26 40 44.2 | 0.329 | | | | | |
| 17 | 18 45 21.85 | 2.5199 | 26 40 19.4 | 0.497 | | | | | |
| 18 | 18 47 53.10 | 2.5217 | 26 39 44.5 | 0.665 | | | | | |
| 19 | 18 50 24.45 | 2.5232 | 26 38 59.6 | 0.833 | | | | | |
| 20 | 18 52 55.89 | 2.5246 | 26 38 4.6 | 1.001 | | | | | |
| 21 | 18 55 27.40 | 2.5258 | 26 36 59.5 | 1.169 | | | | | |
| 22 | 18 57 58.98 | 2.5269 | 26 35 44.3 | 1.338 | | | | | |
| 23 | 19 0 30.63 | 2.5280 | 26 34 19.0 | 1.507 | | | | | |
| 24 | 19 3 2.31 | 2.5288 | S. 26° 32' 43.5" | 1.676 | | | | | |

PHASES OF THE MOON.

| | d | h | m |
|------------------------|--------|----|------|
| ☾ First Quarter . . . | Dec. 8 | 5 | 13.2 |
| ○ Full Moon | 15 | 0 | 52.6 |
| ☾ Last Quarter | 22 | 17 | 38.6 |
| ● New Moon | 30 | 15 | 19.8 |

| | d | h |
|---------------------|---------|-----|
| ☾ Perigee | Dec. 11 | 6.1 |
| ☾ Apogee | 23 | 6.0 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the month. | Name and Direction of Object. | | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|----|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
| 2 | SUN | W. | 12 7 25 | 3044 | 13 36 43 | 3030 | 15 6 18 | 3018 | 16 36 8 | 3006 |
| | Fomalhaut | E. | 70 52 40 | 2866 | 69 19 37 | 2861 | 67 46 28 | 2856 | 66 13 13 | 2852 |
| | α Pegasi | E. | 90 46 19 | 3071 | 89 17 34 | 3061 | 87 48 37 | 3053 | 86 19 30 | 3046 |
| 3 | SUN | W. | 24 8 44 | 2955 | 25 39 53 | 2945 | 27 11 15 | 2936 | 28 42 48 | 2927 |
| | Fomalhaut | E. | 58 26 1 | 2844 | 56 52 30 | 2845 | 55 19 0 | 2847 | 53 45 33 | 2850 |
| | α Pegasi | E. | 78 51 56 | 3019 | 77 22 7 | 3017 | 75 52 15 | 3014 | 74 22 20 | 3014 |
| 4 | SUN | W. | 36 23 25 | 2883 | 37 56 5 | 2875 | 39 28 56 | 2867 | 41 1 57 | 2859 |
| | Fomalhaut | E. | 45 59 55 | 2889 | 44 27 22 | 2903 | 42 55 7 | 2920 | 41 23 13 | 2939 |
| | α Pegasi | E. | 66 52 49 | 3023 | 65 23 5 | 3028 | 63 53 27 | 3035 | 62 23 58 | 3044 |
| 5 | SUN | W. | 48 49 40 | 2819 | 50 23 43 | 2811 | 51 57 56 | 2805 | 53 32 18 | 2797 |
| | α Pegasi | E. | 54 53 56 | 3115 | 53 32 5 | 3137 | 52 4 40 | 3161 | 50 37 44 | 3189 |
| | α Arietis | E. | 95 8 43 | 2572 | 93 29 10 | 2565 | 91 49 27 | 2558 | 90 9 34 | 2551 |
| 6 | SUN | W. | 61 26 34 | 2760 | 63 1 54 | 2753 | 64 37 23 | 2747 | 66 13 1 | 2740 |
| | α Arietis | E. | 81 47 53 | 2590 | 80 7 7 | 2515 | 78 26 14 | 2509 | 76 45 13 | 2504 |
| | Aldebaran | E. | 112 6 19 | 2459 | 110 24 8 | 2452 | 108 41 47 | 2444 | 106 59 15 | 2438 |
| 7 | SUN | W. | 74 13 29 | 2705 | 75 50 2 | 2698 | 77 26 41 | 2692 | 79 3 31 | 2686 |
| | α Aquilæ | W. | 44 24 42 | 4517 | 45 28 19 | 4383 | 46 33 56 | 4360 | 47 41 26 | 4150 |
| | α Arietis | E. | 68 18 29 | 2482 | 66 36 51 | 2479 | 64 55 8 | 2476 | 63 13 21 | 2474 |
| | Aldebaran | E. | 98 24 11 | 2404 | 96 40 42 | 2398 | 94 57 4 | 2391 | 93 13 17 | 2385 |
| 8 | SUN | W. | 87 9 55 | 2654 | 88 47 37 | 2648 | 90 25 27 | 2642 | 92 3 25 | 2636 |
| | α Aquilæ | W. | 53 42 57 | 3722 | 54 59 21 | 3656 | 56 16 55 | 3596 | 57 35 31 | 3541 |
| | α Arietis | E. | 54 43 47 | 2468 | 53 1 49 | 2470 | 51 19 53 | 2472 | 49 38 0 | 2474 |
| | Aldebaran | E. | 84 32 10 | 2356 | 82 47 32 | 2350 | 81 2 45 | 2345 | 79 17 51 | 2339 |
| 9 | SUN | W. | 100 15 12 | 2608 | 101 53 56 | 2603 | 103 32 47 | 2598 | 105 11 45 | 2593 |
| | α Aquilæ | W. | 64 22 35 | 3124 | 65 46 19 | 3289 | 67 10 43 | 3259 | 68 35 43 | 3231 |
| | Fomalhaut | W. | 29 31 8 | 3044 | 31 0 26 | 2265 | 32 31 22 | 2287 | 34 3 45 | 2287 |
| | JUPITER | W. | 17 27 47 | 2117 | 19 10 58 | 2397 | 20 54 37 | 2380 | 22 38 40 | 2366 |
| | α Arietis | E. | 41 10 6 | 2502 | 39 29 5 | 2521 | 37 48 21 | 2537 | 36 7 59 | 2556 |
| | Aldebaran | E. | 70 31 32 | 2316 | 68 45 56 | 2312 | 67 0 14 | 2309 | 65 14 27 | 2304 |
| | Pollux | E. | 114 35 25 | 2368 | 112 49 8 | 2383 | 111 2 43 | 2378 | 109 16 11 | 2374 |
| 10 | SUN | W. | 113 28 8 | 2572 | 115 7 42 | 2569 | 116 47 20 | 2565 | 118 27 3 | 2562 |
| | α Aquilæ | W. | 75 48 14 | 3121 | 77 15 58 | 3105 | 78 44 1 | 3091 | 80 12 21 | 3079 |
| | Fomalhaut | W. | 42 2 6 | 2633 | 43 40 16 | 2606 | 45 19 3 | 2581 | 46 58 24 | 2559 |
| | JUPITER | W. | 31 23 6 | 2320 | 33 8 37 | 2313 | 34 54 17 | 2307 | 36 40 6 | 2302 |
| | Aldebaran | E. | 56 24 18 | 2321 | 54 38 6 | 2329 | 52 51 51 | 2328 | 51 5 34 | 2328 |
| | Pollux | E. | 100 21 55 | 2353 | 98 34 46 | 2349 | 96 47 32 | 2346 | 95 0 13 | 2343 |
| 11 | SUN | W. | 126 46 34 | 2551 | 128 26 36 | 2550 | 130 6 40 | 2550 | 131 46 44 | 2549 |
| | α Aquilæ | W. | 87 37 4 | 3043 | 89 6 23 | 3042 | 90 35 44 | 3041 | 92 5 6 | 3043 |
| | Fomalhaut | W. | 55 21 51 | 2478 | 57 3 35 | 2467 | 58 45 35 | 2457 | 60 27 49 | 2448 |
| | JUPITER | W. | 45 39 52 | 2283 | 47 17 16 | 2281 | 49 3 43 | 2279 | 50 50 13 | 2278 |
| | α Pegasi | W. | 40 3 34 | 3308 | 41 27 36 | 3301 | 42 53 8 | 3164 | 44 20 0 | 3105 |
| | Aldebaran | E. | 42 14 16 | 2324 | 40 28 8 | 2328 | 38 42 6 | 2302 | 36 56 10 | 2309 |
| | Pollux | E. | 86 2 37 | 2332 | 84 14 57 | 2331 | 82 27 15 | 2330 | 80 39 22 | 2329 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|----|------------|----------------|-------------|----------------|-----------|----------------|-------------|----------------|
| 2 | Sun | W. | 18° 6' 13" | 2306 | 19° 36' 31" | 2285 | 21° 7' 3" | 2275 | 22° 37' 47" | 2265 |
| | Fomalhaut | E. | 64 39 53 | 2249 | 63 6 29 | 2247 | 61 33 2 | 2245 | 59 59 32 | 2244 |
| | α Pegasi | E. | 84 50 14 | 3039 | 83 20 50 | 3033 | 81 51 18 | 3028 | 80 21 40 | 3023 |
| 3 | Sun | W. | 30 14 33 | 2218 | 31 46 29 | 2209 | 33 18 37 | 2200 | 34 50 56 | 2202 |
| | Fomalhaut | E. | 52 12 10 | 2235 | 50 38 53 | 2260 | 49 5 43 | 2268 | 47 32 43 | 2277 |
| | α Pegasi | E. | 72 52 21 | 3014 | 71 22 28 | 3014 | 69 52 32 | 3016 | 68 22 39 | 3018 |
| 4 | Sun | W. | 42 35 9 | 2231 | 41 8 31 | 2212 | 45 42 4 | 2235 | 47 15 47 | 2227 |
| | Fomalhaut | E. | 39 51 41 | 2263 | 38 20 45 | 2290 | 36 50 20 | 3024 | 35 20 37 | 3063 |
| | α Pegasi | E. | 60 54 40 | 3055 | 59 25 35 | 3066 | 57 56 44 | 3080 | 56 28 10 | 3096 |
| 5 | Sun | W. | 55 6 50 | 2289 | 56 41 32 | 2282 | 58 16 23 | 2275 | 59 51 24 | 2268 |
| | α Pegasi | E. | 49 11 22 | 3221 | 47 45 38 | 3258 | 46 20 37 | 3299 | 44 56 24 | 3345 |
| | α Arietis | E. | 88 29 32 | 2544 | 86 49 20 | 2538 | 85 9 0 | 2532 | 83 28 31 | 2525 |
| 6 | Sun | W. | 67 48 48 | 2233 | 69 24 44 | 2235 | 71 0 50 | 2219 | 72 37 5 | 2219 |
| | α Arietis | E. | 75 4 5 | 2499 | 73 22 50 | 2494 | 71 41 29 | 2490 | 70 0 2 | 2486 |
| | Aldebaran | E. | 105 16 34 | 2431 | 103 33 43 | 2434 | 101 50 42 | 2417 | 100 7 31 | 2410 |
| 7 | Sun | W. | 80 40 33 | 2279 | 82 17 41 | 2273 | 83 54 57 | 2266 | 85 32 22 | 2260 |
| | α Aquile | W. | 48 50 40 | 4047 | 50 1 33 | 3955 | 51 13 57 | 3870 | 52 27 47 | 3792 |
| | α Arietis | E. | 61 31 31 | 2472 | 59 49 38 | 2470 | 58 7 42 | 2469 | 56 25 45 | 2468 |
| | Aldebaran | E. | 91 29 21 | 2379 | 89 45 16 | 2373 | 88 1 2 | 2367 | 86 16 40 | 2362 |
| 8 | Sun | W. | 93 41 31 | 2230 | 95 19 45 | 2225 | 96 58 6 | 2219 | 98 36 35 | 2213 |
| | α Aquile | W. | 58 55 13 | 3490 | 60 15 48 | 3443 | 61 37 16 | 3400 | 62 59 33 | 3360 |
| | α Arietis | E. | 47 56 10 | 2478 | 46 14 26 | 2483 | 44 32 49 | 2490 | 42 51 22 | 2498 |
| | Aldebaran | E. | 77 32 49 | 2335 | 75 47 40 | 2330 | 74 2 24 | 2325 | 72 17 1 | 2321 |
| 9 | Sun | W. | 106 50 49 | 2583 | 108 30 0 | 2584 | 110 9 17 | 2580 | 111 48 40 | 2576 |
| | α Aquile | W. | 70 1 16 | 3204 | 71 27 20 | 3180 | 72 53 53 | 3158 | 74 20 52 | 3139 |
| | Fomalhaut | W. | 35 37 25 | 2785 | 37 12 12 | 2740 | 38 47 59 | 2700 | 40 24 39 | 2665 |
| | JUPITER | W. | 21 23 3 | 2355 | 26 7 43 | 2344 | 27 52 38 | 2335 | 29 37 46 | 2327 |
| | α Arietis | E. | 31 28 3 | 2579 | 32 48 39 | 2606 | 31 9 52 | 2640 | 29 31 51 | 2679 |
| | Aldebaran | E. | 63 28 34 | 2301 | 61 42 36 | 2298 | 59 56 34 | 2296 | 58 10 28 | 2293 |
| | Pollux | E. | 107 29 33 | 2269 | 105 42 48 | 2264 | 103 55 56 | 2260 | 102 8 58 | 2257 |
| 10 | Sun | W. | 120 6 50 | 2259 | 121 46 41 | 2256 | 123 26 36 | 2254 | 125 6 34 | 2253 |
| | α Aquile | W. | 81 40 56 | 3069 | 83 9 44 | 3060 | 84 38 43 | 3053 | 86 7 50 | 3047 |
| | Fomalhaut | W. | 48 38 16 | 2539 | 50 18 35 | 2521 | 51 59 19 | 2505 | 53 40 25 | 2491 |
| | JUPITER | W. | 38 26 3 | 2297 | 40 12 7 | 2293 | 41 58 17 | 2289 | 43 44 32 | 2286 |
| | Aldebaran | E. | 49 19 17 | 2288 | 47 33 0 | 2288 | 45 46 43 | 2289 | 44 0 28 | 2291 |
| | Pollux | E. | 93 12 49 | 2240 | 91 25 21 | 2238 | 89 37 50 | 2235 | 87 50 15 | 2233 |
| 11 | Sun | W. | 133 26 49 | 2549 | 135 6 54 | 2550 | 136 46 58 | 2551 | 138 27 1 | 2552 |
| | α Aquile | W. | 93 34 26 | 3045 | 95 3 43 | 3050 | 96 32 54 | 3056 | 98 1 58 | 3064 |
| | Fomalhaut | W. | 62 10 15 | 2441 | 63 52 52 | 2434 | 65 35 38 | 2429 | 67 18 32 | 2424 |
| | JUPITER | W. | 52 36 45 | 2277 | 54 23 18 | 2277 | 56 9 52 | 2276 | 57 56 27 | 2277 |
| | α Pegasi | W. | 45 48 3 | 3052 | 47 17 11 | 3005 | 48 47 17 | 2964 | 50 18 15 | 2927 |
| | Aldebaran | E. | 35 10 23 | 2315 | 33 24 46 | 2325 | 31 39 23 | 2336 | 29 54 16 | 2350 |
| | Pollux | E. | 78 51 47 | 2229 | 77 4 2 | 2229 | 75 16 17 | 2229 | 73 28 33 | 2230 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|--------------|----------------|-------------|----------------|--------------|----------------|
| 12 | α Aquilæ W. | 99° 30' 52" | 3074 | 100° 59' 33" | 3086 | 102° 28' 0" | 3100 | 103° 56' 10" | 3115 |
| | Fomalhaut W. | 69 1 33 | 2440 | 70 44 39 | 2418 | 72 27 48 | 2416 | 74 11 0 | 2415 |
| | JUPITER W. | 59 43 1 | 2277 | 61 29 34 | 2278 | 63 16 6 | 2280 | 65 2 35 | 2283 |
| | α Pegasi W. | 51 50 0 | 2294 | 53 22 26 | 2265 | 54 55 30 | 2239 | 56 29 7 | 2217 |
| | Pollux E. | 71 40 50 | 2231 | 69 53 9 | 2233 | 68 5 30 | 2235 | 66 17 54 | 2237 |
| | Regulus E. | 107 58 28 | 2244 | 106 11 6 | 2245 | 104 23 45 | 2247 | 102 36 27 | 2248 |
| 13 | Fomalhaut W. | 82 46 57 | 2422 | 84 30 0 | 2426 | 86 12 57 | 2431 | 87 55 48 | 2436 |
| | JUPITER W. | 73 54 0 | 2299 | 75 40 1 | 2304 | 77 25 55 | 2309 | 79 11 41 | 2315 |
| | α Pegasi W. | 64 23 23 | 2741 | 65 59 8 | 2733 | 67 35 4 | 2726 | 69 11 9 | 2721 |
| | α Arietis W. | 20 59 23 | 2026 | 22 29 3 | 2024 | 24 0 52 | 2042 | 25 34 25 | 2776 |
| | Pollux E. | 57 21 2 | 2256 | 55 33 57 | 2261 | 53 47 0 | 2266 | 52 0 11 | 2272 |
| | Regulus E. | 93 40 53 | 2266 | 91 54 3 | 2270 | 90 7 20 | 2275 | 88 20 44 | 2281 |
| 14 | Fomalhaut W. | 96 27 50 | 2474 | 98 9 40 | 2483 | 99 51 17 | 2494 | 101 32 39 | 2505 |
| | JUPITER W. | 87 58 14 | 2350 | 89 43 0 | 2358 | 91 27 35 | 2367 | 93 11 57 | 2376 |
| | α Pegasi W. | 77 12 40 | 2716 | 78 48 58 | 2719 | 80 25 12 | 2724 | 82 1 20 | 2730 |
| | α Arietis W. | 33 38 54 | 2599 | 35 17 50 | 2583 | 36 57 8 | 2570 | 38 36 44 | 2561 |
| | Pollux E. | 43 8 20 | 2309 | 41 22 43 | 2317 | 39 37 9 | 2297 | 37 51 49 | 2337 |
| | Regulus E. | 79 30 6 | 2316 | 77 44 30 | 2325 | 75 59 7 | 2334 | 74 13 57 | 2343 |
| 15 | JUPITER W. | 101 50 15 | 2429 | 103 33 9 | 2441 | 105 15 46 | 2453 | 106 58 6 | 2465 |
| | α Pegasi W. | 89 59 40 | 2773 | 91 34 43 | 2785 | 93 9 30 | 2798 | 94 44 0 | 2812 |
| | α Arietis W. | 46 56 55 | 2547 | 48 37 3 | 2550 | 50 17 7 | 2553 | 51 57 6 | 2558 |
| | Pollux E. | 29 8 58 | 2394 | 27 25 14 | 2408 | 25 41 50 | 2422 | 23 58 46 | 2437 |
| | Regulus E. | 65 31 40 | 2396 | 63 48 0 | 2408 | 62 4 36 | 2420 | 60 21 30 | 2433 |
| | Spica E. | 119 34 32 | 2398 | 117 50 55 | 2410 | 116 7 34 | 2420 | 114 24 28 | 2432 |
| 16 | JUPITER W. | 115 25 17 | 2531 | 117 5 47 | 2545 | 118 45 57 | 2560 | 120 25 47 | 2574 |
| | α Pegasi W. | 102 31 35 | 2896 | 104 3 59 | 2916 | 105 35 57 | 2937 | 107 7 29 | 2959 |
| | α Arietis W. | 60 14 55 | 2596 | 61 53 55 | 2606 | 63 32 42 | 2617 | 65 11 14 | 2627 |
| | Aldebaran W. | 29 34 29 | 2590 | 31 13 38 | 2593 | 32 52 42 | 2599 | 34 31 39 | 2604 |
| | Regulus E. | 51 50 39 | 2502 | 50 9 28 | 2516 | 48 28 37 | 2531 | 46 48 7 | 2547 |
| | Spica E. | 105 53 12 | 2494 | 104 11 50 | 2507 | 102 30 47 | 2521 | 100 50 3 | 2535 |
| 17 | α Arietis W. | 73 20 2 | 2689 | 74 56 57 | 2702 | 76 33 34 | 2715 | 78 9 54 | 2728 |
| | Aldebaran W. | 42 43 49 | 2651 | 44 21 35 | 2662 | 45 59 6 | 2674 | 47 36 21 | 2687 |
| | Regulus E. | 38 31 11 | 2630 | 36 52 57 | 2649 | 35 15 8 | 2667 | 33 37 44 | 2686 |
| | Spica E. | 92 31 13 | 2606 | 90 52 26 | 2621 | 89 14 0 | 2636 | 87 35 54 | 2651 |
| 18 | α Arietis W. | 86 6 53 | 2801 | 87 41 20 | 2815 | 89 15 29 | 2829 | 90 49 19 | 2845 |
| | Aldebaran W. | 55 38 23 | 2750 | 57 13 56 | 2764 | 58 49 11 | 2777 | 60 24 9 | 2791 |
| | Spica E. | 79 30 26 | 2726 | 77 54 21 | 2741 | 76 18 35 | 2756 | 74 43 9 | 2771 |
| 19 | α Arietis W. | 98 33 43 | 2817 | 100 5 40 | 2831 | 101 37 19 | 2846 | 103 8 40 | 2860 |
| | Aldebaran W. | 68 14 36 | 2857 | 69 47 50 | 2869 | 71 20 48 | 2882 | 72 53 30 | 2895 |
| | Pollux W. | 23 59 20 | 2845 | 25 32 50 | 2856 | 27 6 5 | 2868 | 28 39 5 | 2879 |
| | Spica E. | 66 50 48 | 2843 | 65 17 16 | 2857 | 63 44 2 | 2871 | 62 11 6 | 2884 |
| | Sun E. | 131 20 34 | 3199 | 129 54 24 | 3214 | 128 28 31 | 3227 | 127 2 54 | 3241 |
| 20 | Aldebaran W. | 80 33 3 | 2954 | 82 4 13 | 2965 | 83 35 10 | 2976 | 85 5 53 | 2985 |
| | Pollux W. | 36 20 30 | 2935 | 37 52 5 | 2946 | 39 23 26 | 2955 | 40 54 35 | 2965 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Midnight. | P. L. of Diff. | XVh. | P. L. of Diff. | XVIIIh. | P. L. of Diff. | XXIh. | P. L. of Diff. |
|-------------------|-------------------------------|-------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|
| 12 | α Aquilæ W. | 105° 24' 1" | 3133 | 106° 51' 30" | 3151 | 108° 18' 34" | 3177 | 109° 45' 11" | 3203 |
| | Fomalhaut W. | 75 54 13 | 2415 | 77 37 26 | 2415 | 79 20 39 | 2417 | 81 3 50 | 2419 |
| | JUPITER W. | 66 49 0 | 2285 | 68 35 22 | 2287 | 70 21 40 | 2291 | 72 7 53 | 2295 |
| | α Pegasi W. | 58 3 13 | 2797 | 59 37 45 | 2780 | 61 12 39 | 2765 | 62 47 53 | 2753 |
| | Pollux E. | 64 30 22 | 2240 | 62 42 54 | 2243 | 60 55 31 | 2247 | 59 8 13 | 2251 |
| | Regulus E. | 100 49 11 | 2251 | 99 1 59 | 2254 | 97 14 52 | 2258 | 95 27 50 | 2261 |
| 13 | Fomalhaut W. | 89 38 32 | 2442 | 91 21 7 | 2449 | 93 3 32 | 2456 | 94 45 47 | 2465 |
| | JUPITER W. | 80 57 19 | 2391 | 82 42 48 | 2398 | 84 28 7 | 2335 | 86 13 16 | 2342 |
| | α Pegasi W. | 70 47 21 | 2717 | 72 23 38 | 2715 | 73 59 58 | 2714 | 75 36 19 | 2714 |
| | α Arietis W. | 27 9 24 | 2724 | 28 45 32 | 2681 | 30 22 37 | 2648 | 32 0 27 | 2631 |
| | Pollux E. | 50 13 30 | 2279 | 48 26 59 | 2285 | 46 40 38 | 2293 | 44 54 28 | 2300 |
| | Regulus E. | 86 34 17 | 2287 | 84 47 59 | 2294 | 83 1 51 | 2301 | 81 15 53 | 2309 |
| 14 | Fomalhaut W. | 103 13 45 | 2517 | 104 54 34 | 2530 | 106 35 6 | 2543 | 108 15 19 | 2559 |
| | JUPITER W. | 94 56 6 | 2386 | 96 40 1 | 2396 | 98 23 41 | 2407 | 100 7 6 | 2418 |
| | α Pegasi W. | 83 37 20 | 2736 | 85 13 12 | 2744 | 86 48 53 | 2753 | 88 24 23 | 2763 |
| | α Arietis W. | 40 16 33 | 2553 | 41 56 32 | 2549 | 43 36 37 | 2546 | 45 16 46 | 2546 |
| | Pollux E. | 36 6 44 | 2347 | 34 21 53 | 2358 | 32 37 18 | 2369 | 30 52 59 | 2382 |
| | Regulus E. | 72 29 0 | 2353 | 70 44 18 | 2363 | 68 59 50 | 2373 | 67 15 37 | 2384 |
| 15 | JUPITER W. | 108 40 9 | 2477 | 110 21 54 | 2491 | 112 3 20 | 2504 | 113 44 28 | 2517 |
| | α Pegasi W. | 96 18 12 | 2297 | 97 52 5 | 2243 | 99 25 37 | 2260 | 100 58 47 | 2277 |
| | α Arietis W. | 53 36 59 | 2564 | 55 16 43 | 2571 | 56 56 18 | 2579 | 58 35 42 | 2587 |
| | Pollux E. | 22 16 4 | 2453 | 20 33 45 | 2470 | 18 51 50 | 2489 | 17 10 21 | 2510 |
| | Regulus E. | 58 38 42 | 2446 | 56 56 13 | 2459 | 55 14 2 | 2475 | 53 32 11 | 2487 |
| | Spica E. | 112 41 39 | 2443 | 110 59 6 | 2455 | 109 16 50 | 2468 | 107 34 52 | 2481 |
| 16 | JUPITER W. | 122 5 17 | 2589 | 123 44 27 | 2604 | 125 23 16 | 2620 | 127 1 44 | 2636 |
| | α Pegasi W. | 108 38 33 | 2282 | 110 9 8 | 2305 | 111 39 14 | 2331 | 113 8 48 | 2357 |
| | α Arietis W. | 66 49 32 | 2639 | 68 27 34 | 2651 | 70 5 20 | 2663 | 71 42 49 | 2675 |
| | Aldebaran W. | 36 10 28 | 2612 | 37 49 7 | 2621 | 39 27 34 | 2630 | 41 5 48 | 2640 |
| | Regulus E. | 45 7 59 | 2563 | 43 28 13 | 2579 | 41 48 49 | 2596 | 40 9 48 | 2613 |
| | Spica E. | 99 9 38 | 2548 | 97 29 32 | 2563 | 95 49 46 | 2577 | 94 10 19 | 2592 |
| 17 | α Arietis W. | 79 45 55 | 2743 | 81 21 38 | 2757 | 82 57 2 | 2772 | 84 32 7 | 2786 |
| | Aldebaran W. | 49 13 19 | 2689 | 50 50 0 | 2711 | 52 26 25 | 2724 | 54 2 33 | 2738 |
| | Regulus E. | 32 0 45 | 2706 | 30 24 13 | 2726 | 28 48 8 | 2748 | 27 12 32 | 2770 |
| | Spica E. | 85 58 8 | 2666 | 84 20 42 | 2681 | 82 43 37 | 2695 | 81 6 51 | 2711 |
| 18 | α Arietis W. | 92 22 49 | 2859 | 93 56 0 | 2873 | 95 28 53 | 2888 | 97 1 27 | 2902 |
| | Aldebaran W. | 61 58 49 | 2804 | 63 33 12 | 2818 | 65 7 17 | 2831 | 66 41 5 | 2844 |
| | Spica E. | 73 8 3 | 2765 | 71 33 16 | 2800 | 69 58 48 | 2815 | 68 24 39 | 2828 |
| 19 | α Arietis W. | 104 39 43 | 2974 | 105 10 28 | 2988 | 107 40 56 | 3002 | 109 11 6 | 3016 |
| | Aldebaran W. | 74 25 55 | 2907 | 75 58 5 | 2920 | 77 29 59 | 2931 | 79 1 38 | 2942 |
| | Pollux W. | 30 11 51 | 2891 | 31 44 22 | 2901 | 33 16 39 | 2912 | 34 48 42 | 2924 |
| | Spica E. | 60 38 27 | 2898 | 59 6 6 | 2911 | 57 34 1 | 2924 | 56 2 12 | 2937 |
| | SUN E. | 125 37 33 | 3255 | 124 12 29 | 3268 | 122 47 40 | 3282 | 121 23 7 | 3295 |
| 20 | Aldebaran W. | 86 36 24 | 2996 | 88 6 42 | 3005 | 89 36 48 | 3014 | 91 6 43 | 3024 |
| | Pollux W. | 42 25 31 | 2975 | 43 56 15 | 2984 | 45 26 48 | 2993 | 46 57 9 | 3001 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | Noon. | P. L. of Diff. | IIIh. | P. L. of Diff. | VIh. | P. L. of Diff. | IXh. | P. L. of Diff. |
|-------------------|-------------------------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
| 20 | Spica E. | 54 30 40 | 2949 | 52 59 23 | 2962 | 51 28 22 | 2973 | 49 57 35 | 2985 |
| | Mars E. | 69 30 18 | 3154 | 68 3 14 | 3167 | 66 36 25 | 3178 | 65 9 49 | 3189 |
| | Sun E. | 119 58 50 | 3307 | 118 34 47 | 3319 | 117 10 58 | 3331 | 115 47 22 | 3343 |
| 21 | Aldebaran W. | 92 36 26 | 3032 | 94 5 59 | 3040 | 95 35 22 | 3048 | 97 4 35 | 3056 |
| | Pollux W. | 48 27 20 | 3069 | 49 57 21 | 3078 | 51 27 12 | 3085 | 52 56 54 | 3093 |
| | Spica E. | 42 27 15 | 3039 | 40 57 51 | 3050 | 39 28 40 | 3060 | 37 59 41 | 3070 |
| | Mars E. | 57 59 58 | 3238 | 56 34 34 | 3246 | 55 9 19 | 3254 | 53 44 14 | 3261 |
| | Sun E. | 108 52 31 | 3393 | 107 30 7 | 3401 | 106 7 52 | 3409 | 104 45 46 | 3418 |
| 22 | Aldebaran W. | 104 28 37 | 3080 | 105 57 4 | 3090 | 107 25 26 | 3095 | 108 53 42 | 3098 |
| | Pollux W. | 60 23 27 | 3059 | 61 52 27 | 3064 | 63 21 21 | 3067 | 64 50 11 | 3070 |
| | Regulus W. | 24 25 7 | 3138 | 25 52 31 | 3134 | 27 19 59 | 3131 | 28 47 31 | 3128 |
| | Spica E. | 30 37 48 | 3119 | 29 10 2 | 3129 | 27 42 28 | 3141 | 26 15 8 | 3153 |
| | Mars E. | 46 40 47 | 3291 | 45 16 25 | 3296 | 43 52 9 | 3300 | 42 27 58 | 3304 |
| | Antares E. | 76 18 16 | 3063 | 74 49 21 | 3067 | 73 20 31 | 3071 | 71 51 46 | 3074 |
| | Sun E. | 97 57 21 | 3449 | 96 36 0 | 3454 | 95 14 44 | 3458 | 93 53 33 | 3462 |
| | | | | | | | | | |
| 23 | Aldebaran W. | 116 14 4 | 3111 | 117 42 0 | 3119 | 119 9 55 | 3113 | 120 37 49 | 3114 |
| | Pollux W. | 72 13 35 | 3078 | 73 42 11 | 3079 | 75 10 46 | 3078 | 76 39 22 | 3078 |
| | Regulus W. | 36 5 59 | 3116 | 37 33 49 | 3114 | 39 1 42 | 3111 | 40 29 38 | 3108 |
| | Mars E. | 35 27 49 | 3313 | 34 3 52 | 3313 | 32 39 56 | 3313 | 31 16 0 | 3312 |
| | Antares E. | 64 28 51 | 3081 | 63 0 22 | 3084 | 61 31 53 | 3085 | 60 3 25 | 3084 |
| | Sun E. | 87 8 26 | 3471 | 85 47 30 | 3472 | 84 26 35 | 3471 | 83 5 39 | 3471 |
| | | | | | | | | | |
| 24 | Pollux W. | 84 2 48 | 3066 | 85 31 39 | 3063 | 87 0 34 | 3058 | 88 29 35 | 3054 |
| | Regulus W. | 47 50 19 | 3089 | 49 18 42 | 3084 | 50 47 11 | 3079 | 52 15 46 | 3073 |
| | Antares E. | 52 40 43 | 3075 | 51 12 3 | 3072 | 49 43 19 | 3068 | 48 14 30 | 3065 |
| | Sun E. | 76 20 38 | 3460 | 74 59 29 | 3455 | 73 38 15 | 3452 | 72 16 57 | 3446 |
| 25 | Pollux W. | 95 56 14 | 3024 | 97 25 57 | 3017 | 98 55 49 | 3009 | 100 25 50 | 3001 |
| | Regulus W. | 59 40 33 | 3040 | 61 9 56 | 3039 | 62 39 29 | 3034 | 64 9 12 | 3016 |
| | Antares E. | 40 49 6 | 3039 | 39 19 42 | 3033 | 37 50 10 | 3026 | 36 20 30 | 3021 |
| | Sun E. | 65 28 53 | 3415 | 64 6 54 | 3408 | 62 44 46 | 3400 | 61 22 29 | 3392 |
| 26 | Pollux W. | 107 58 35 | 2956 | 109 29 43 | 2946 | 111 1 4 | 2935 | 112 32 38 | 2925 |
| | Regulus W. | 71 40 34 | 2968 | 73 11 27 | 2958 | 74 42 33 | 2947 | 76 13 52 | 2936 |
| | Spica W. | 18 0 41 | 3109 | 19 28 40 | 3078 | 20 57 16 | 3052 | 22 26 25 | 3036 |
| | Antares E. | 28 50 9 | 2986 | 27 19 39 | 2981 | 25 49 2 | 2974 | 24 18 17 | 2969 |
| | Sun E. | 54 28 31 | 3343 | 53 5 9 | 3333 | 51 41 36 | 3322 | 50 17 50 | 3312 |
| 27 | Regulus W. | 83 54 2 | 2878 | 85 26 49 | 2866 | 86 59 52 | 2853 | 88 33 11 | 2841 |
| | Spica W. | 29 59 20 | 2924 | 31 31 9 | 2907 | 33 3 19 | 2890 | 34 35 51 | 2874 |
| | Sun E. | 43 15 43 | 3253 | 41 50 36 | 3241 | 40 25 15 | 3228 | 38 59 39 | 3216 |
| 28 | Regulus W. | 96 23 53 | 2776 | 97 58 52 | 2763 | 99 34 8 | 2750 | 101 9 41 | 2737 |
| | Spica W. | 42 23 38 | 2795 | 43 58 12 | 2780 | 45 33 6 | 2766 | 47 8 19 | 2750 |
| | Sun E. | 31 48 2 | 3155 | 30 20 59 | 3144 | 28 53 43 | 3133 | 27 26 14 | 3123 |
| 29 | Regulus W. | 109 11 47 | 2672 | 110 49 4 | 2660 | 112 26 38 | 2647 | 114 4 29 | 2635 |
| | Spica W. | 55 9 16 | 2679 | 56 46 24 | 2665 | 58 23 51 | 2651 | 60 1 37 | 2638 |
| | Sun E. | 20 6 0 | 3086 | 18 37 33 | 3086 | 17 9 6 | 3088 | 15 40 42 | 3087 |

GREENWICH MEAN TIME.

LUNAR DISTANCES.

| Day of the Month. | Name and Direction of Object. | | Midnight. | P. L. of Diff. | XV ^h . | P. L. of Diff. | XVIII ^h . | P. L. of Diff. | XXI ^h . | P. L. of Diff. |
|-------------------|-------------------------------|----|-----------|----------------|-------------------|----------------|----------------------|----------------|--------------------|----------------|
| 20 | Spica | E. | 48 27 3 | 2996 | 46 56 45 | 3008 | 45 26 42 | 3018 | 43 56 52 | 3029 |
| | Mars | E. | 53 43 27 | 3199 | 62 17 17 | 3209 | 60 51 19 | 3220 | 59 25 33 | 3229 |
| | Sun | E. | 114 24 0 | 3253 | 113 0 50 | 3261 | 111 37 52 | 3274 | 110 15 6 | 3284 |
| 21 | Aldebaran | W. | 98 33 39 | 3062 | 100 2 35 | 3069 | 101 31 23 | 3075 | 103 0 3 | 3080 |
| | Pollux | W. | 54 26 27 | 3038 | 55 55 53 | 3044 | 57 25 11 | 3050 | 58 54 22 | 3055 |
| | Spica | E. | 36 30 55 | 3080 | 35 2 21 | 3089 | 33 33 58 | 3099 | 32 5 47 | 3109 |
| | Mars | E. | 52 19 17 | 3269 | 50 54 29 | 3275 | 49 29 48 | 3281 | 48 5 14 | 3287 |
| | Sun | E. | 103 23 50 | 3425 | 102 2 2 | 3431 | 100 40 21 | 3438 | 99 18 48 | 3444 |
| 22 | Aldebaran | W. | 110 21 54 | 3102 | 111 50 1 | 3105 | 113 18 5 | 3107 | 114 46 6 | 3110 |
| | Pollux | W. | 66 18 57 | 3073 | 67 47 40 | 3075 | 69 16 20 | 3077 | 70 44 58 | 3078 |
| | Regulus | W. | 30 15 7 | 3195 | 31 42 46 | 3193 | 33 10 28 | 3191 | 34 38 12 | 3119 |
| | Spica | E. | 24 48 2 | 3166 | 23 21 12 | 3181 | 21 54 40 | 3198 | 20 28 28 | 3216 |
| | Mars | E. | 41 3 51 | 3306 | 39 39 47 | 3309 | 38 15 46 | 3311 | 36 51 47 | 3312 |
| | Antares | E. | 70 23 5 | 3078 | 68 54 28 | 3079 | 67 25 53 | 3082 | 65 57 21 | 3083 |
| | Sun | E. | 92 32 26 | 3464 | 91 11 22 | 3467 | 89 50 21 | 3470 | 88 29 23 | 3471 |
| | | | | | | | | | | |
| 23 | Aldebaran | W. | 122 5 42 | 3114 | 123 33 35 | 3113 | 125 1 29 | 3119 | 126 29 24 | 3111 |
| | Pollux | W. | 78 7 59 | 3077 | 79 36 37 | 3074 | 81 5 18 | 3073 | 82 34 1 | 3069 |
| | Regulus | W. | 41 57 38 | 3105 | 43 25 41 | 3101 | 44 53 49 | 3098 | 46 22 1 | 3093 |
| | Mars | E. | 29 52 2 | 3311 | 28 28 3 | 3308 | 27 4 1 | 3306 | 25 39 57 | 3304 |
| | Antares | E. | 58 34 56 | 3083 | 57 6 26 | 3082 | 55 37 54 | 3080 | 54 9 20 | 3078 |
| | Sun | E. | 81 44 43 | 3470 | 80 23 45 | 3469 | 79 2 46 | 3468 | 77 41 44 | 3463 |
| 24 | Pollux | W. | 89 58 41 | 3048 | 91 27 54 | 3043 | 92 57 13 | 3037 | 94 26 40 | 3031 |
| | Regulus | W. | 53 44 28 | 3068 | 55 13 17 | 3061 | 56 42 14 | 3055 | 58 11 19 | 3047 |
| | Antares | E. | 46 45 37 | 3060 | 45 16 39 | 3055 | 43 47 34 | 3050 | 42 18 23 | 3045 |
| | Sun | E. | 70 55 33 | 3441 | 69 34 3 | 3436 | 68 12 27 | 3430 | 66 50 44 | 3423 |
| 25 | Pollux | W. | 101 56 1 | 2993 | 103 26 23 | 2995 | 104 56 55 | 2975 | 106 27 39 | 2965 |
| | Regulus | W. | 65 39 5 | 3006 | 67 9 10 | 2997 | 68 39 26 | 2988 | 70 9 54 | 2978 |
| | Antares | E. | 34 50 43 | 3014 | 33 20 47 | 3007 | 31 50 43 | 3000 | 30 20 30 | 2993 |
| | Sun | E. | 60 0 3 | 3382 | 58 37 26 | 3373 | 57 14 39 | 3364 | 55 51 41 | 3353 |
| 26 | Pollux | W. | 114 4 25 | 2914 | 115 36 26 | 2902 | 117 8 42 | 2891 | 118 41 12 | 2880 |
| | Regulus | W. | 77 45 25 | 2925 | 79 17 12 | 2913 | 80 49 14 | 2902 | 82 21 30 | 2890 |
| | Spica | W. | 23 56 6 | 3003 | 25 26 15 | 2981 | 26 56 52 | 2961 | 28 27 54 | 2942 |
| | Antares | E. | 22 47 26 | 2965 | 21 16 29 | 2962 | 19 45 29 | 2961 | 18 14 27 | 2962 |
| | Sun | E. | 48 53 52 | 3300 | 47 29 40 | 3288 | 46 5 15 | 3276 | 44 40 36 | 3265 |
| 27 | Regulus | W. | 90 6 46 | 2898 | 91 40 38 | 2815 | 93 14 46 | 2802 | 94 49 11 | 2789 |
| | Spica | W. | 36 8 43 | 2858 | 37 41 56 | 2842 | 39 15 30 | 2826 | 40 49 24 | 2811 |
| | Sun | E. | 37 33 49 | 3204 | 36 7 44 | 3191 | 34 41 24 | 3179 | 33 14 50 | 3168 |
| 28 | Regulus | W. | 102 45 32 | 2724 | 104 21 40 | 2711 | 105 58 5 | 2698 | 107 34 47 | 2685 |
| | Spica | W. | 48 43 52 | 2736 | 50 19 44 | 2721 | 51 55 56 | 2707 | 53 32 27 | 2693 |
| | Sun | E. | 25 58 32 | 3114 | 24 30 39 | 3105 | 23 2 35 | 3097 | 21 34 22 | 3090 |
| 29 | Regulus | W. | 115 42 37 | 2623 | 117 21 1 | 2610 | 118 59 42 | 2599 | 120 38 39 | 2586 |
| | Spica | W. | 61 39 41 | 2624 | 63 18 3 | 2611 | 64 56 43 | 2598 | 66 35 41 | 2585 |
| | Sun | E. | 14 12 29 | 3114 | 12 44 37 | 3144 | 11 17 21 | 3193 | 9 51 3 | 3267 |

GREENWICH MEAN TIME.

| JANUARY. | | | | | | FEBRUARY. | | | | | |
|--|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|---|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m |
| 1 | 20 7 17.87 | + 5.151 | -20 39 7.7 | +53.58 | 1 23.8 | 1 | 19 14 28.85 | + 8.040 | -20 49 3.8 | -13.19 | 22 28.3 |
| 2 | 20 9 1.65 | 3.474 | 20 18 5.4 | 51.47 | 1 21.5 | 2 | 19 17 50.56 | 8.758 | 20 53 54.1 | 10.99 | 22 28.0 |
| 3 | 20 10 3.54 | + 1.663 | 19 58 3.4 | 48.56 | 1 18.6 | 3 | 19 21 23.70 | 9.410 | 20 57 49.9 | 8.85 | 22 27.9 |
| 4 | 20 10 20.56 | - 0.964 | 19 39 20.7 | 44.86 | 1 14.9 | 4 | 19 25 21.78 | 10.003 | 21 0 48.2 | 6.19 | 22 28.1 |
| 5 | 20 9 50.27 | 9.979 | 19 22 16.0 | 40.42 | 1 10.4 | 5 | 19 29 28.43 | 10.543 | 21 2 46.3 | 3.63 | 22 28.4 |
| 6 | 20 8 31.21 | - 4.319 | -19 7 5.8 | +35.33 | 1 5.2 | 6 | 19 33 47.43 | +11.034 | -21 3 41.7 | - 0.97 | 22 29.0 |
| 7 | 20 6 23.13 | 6.346 | 18 54 4.2 | 29.73 | 0 59.1 | 7 | 19 38 17.68 | 11.480 | 21 3 32.4 | + 1.77 | 22 29.7 |
| 8 | 20 3 27.31 | 8.984 | 18 43 21.4 | 23.80 | 0 52.2 | 8 | 19 42 58.14 | 11.856 | 21 2 16.5 | 4.58 | 22 30.6 |
| 9 | 19 59 46.88 | 10.051 | 18 35 2.7 | 17.75 | 0 44.6 | 9 | 19 47 47.90 | 12.256 | 20 59 52.3 | 7.45 | 22 31.6 |
| 10 | 19 55 26.85 | 11.568 | 18 29 9.1 | 11.77 | 0 36.4 | 10 | 19 52 46.15 | 12.593 | 20 56 18.5 | 10.38 | 22 32.7 |
| 11 | 19 50 34.17 | -12.761 | -18 25 36.7 | + 6.02 | 0 27.6 | 11 | 19 57 52.13 | +12.901 | -20 51 33.5 | +13.37 | 22 34.0 |
| 12 | 19 45 17.37 | 13.570 | 18 24 17.2 | + 0.69 | 0 18.4 | 12 | 20 3 5.17 | 13.182 | 20 45 36.5 | 16.39 | 22 35.4 |
| 13 | 19 39 46.16 | 13.957 | 18 24 59.6 | - 4.12 | 0 9.0 | 13 | 20 8 24.67 | 13.439 | 20 38 26.6 | 19.44 | 22 36.9 |
| 14 | 19 34 10.83 | 13.915 | 18 27 30.5 | 8.35 | 23 50.2 | 14 | 20 13 50.07 | 13.674 | 20 30 2.7 | 22.54 | 22 38.4 |
| 15 | 19 28 41.49 | 13.463 | 18 31 35.9 | 12.00 | 23 41.1 | 15 | 20 19 20.87 | 13.889 | 20 20 24.1 | 25.67 | 22 40.1 |
| 16 | 19 23 27.51 | -12.644 | -18 37 2.0 | -15.08 | 23 32.3 | 16 | 20 24 56.61 | +14.086 | -20 9 30.2 | +26.81 | 22 41.8 |
| 17 | 19 18 36.90 | 11.526 | 18 43 35.7 | 17.63 | 23 24.0 | 17 | 20 30 36.90 | 14.369 | 19 57 20.7 | 31.98 | 22 43.6 |
| 18 | 19 14 16.06 | 10.177 | 18 51 4.6 | 19.71 | 23 16.4 | 18 | 20 36 21.40 | 14.437 | 19 43 54.9 | 35.18 | 22 45.5 |
| 19 | 19 10 29.68 | 8.668 | 18 59 18.1 | 21.34 | 23 9.3 | 19 | 20 42 9.77 | 14.591 | 19 29 12.2 | 38.38 | 22 47.4 |
| 20 | 19 7 20.76 | 7.666 | 19 8 5.7 | 22.56 | 23 2.8 | 20 | 20 48 1.71 | 14.734 | 19 13 12.6 | 41.59 | 22 49.4 |
| 21 | 19 4 50.79 | - 5.431 | -19 17 18.0 | -23.40 | 22 57.0 | 21 | 20 53 56.95 | +14.867 | -18 55 55.8 | +44.81 | 22 51.4 |
| 22 | 19 3 0.02 | 3.806 | 19 26 46.2 | 23.89 | 22 51.9 | 22 | 20 59 55.26 | 14.991 | 18 37 21.4 | 48.05 | 22 53.5 |
| 23 | 19 1 47.76 | 2.226 | 19 36 21.9 | 24.04 | 22 47.4 | 23 | 21 5 56.44 | 15.106 | 18 17 29.3 | 51.30 | 22 55.6 |
| 24 | 19 1 12.57 | - 0.719 | 19 45 57.3 | 23.86 | 22 43.4 | 24 | 21 12 0.31 | 15.215 | 17 56 19.2 | 54.55 | 22 57.8 |
| 25 | 19 1 12.57 | + 0.703 | 19 53 24.8 | 23.38 | 22 40.0 | 25 | 21 18 6.71 | 15.317 | 17 33 51.1 | 57.80 | 23 0.0 |
| 26 | 19 1 45.58 | + 2.031 | -20 4 37.3 | -22.62 | 22 37.0 | 26 | 21 24 15.50 | +15.415 | -17 10 4.9 | +61.05 | 23 2.2 |
| 27 | 19 2 49.27 | 3.261 | 20 13 28.4 | 21.59 | 22 34.6 | 27 | 21 30 26.57 | 15.507 | 16 45 0.6 | 64.31 | 23 4.5 |
| 28 | 19 4 21.33 | 4.395 | 20 21 51.8 | 20.32 | 22 32.6 | 28 | 21 36 39.81 | 15.596 | 16 18 38.2 | 67.56 | 23 6.8 |
| 29 | 19 6 19.46 | 5.434 | 20 29 41.9 | 18.82 | 22 31.0 | 29 | 21 42 55.15 | 15.682 | 15 50 57.6 | 70.82 | 23 9.2 |
| 30 | 19 8 41.45 | 6.384 | 20 36 53.6 | 17.12 | 22 29.8 | 30 | 21 49 12.52 | 15.765 | 15 21 59.0 | 74.07 | 23 11.6 |
| 31 | 19 11 25.22 | + 7.250 | -20 43 22.3 | -15.24 | 22 28.9 | 31 | 21 55 31.87 | +15.847 | -14 51 42.4 | +77.32 | 23 14.0 |
| 32 | 19 14 28.85 | + 8.040 | -20 49 3.8 | -13.19 | 22 28.3 | 32 | 22 1 53.18 | +15.928 | -14 20 7.8 | +80.56 | 23 16.4 |
| Day of the Month. | | | | | | Day of the Month. | | | | | |
| 1st. 6th. 11th. 16th. 21st. 26th. 31st. | | | | | | 5th. 10th. 15th. 20th. 25th. | | | | | |
| Semidiameter . . 3.8 4.4 4.9 5.0 4.7 4.2 3.8 | | | | | | Semidiameter. 3.4 3.2 3.0 2.8 2.7 | | | | | |
| Hor. Parallax . . 10.0 11.6 13.0 13.2 12.3 11.1 10.0 | | | | | | Hor. Parallax 9.1 8.4 7.9 7.4 7.1 | | | | | |

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

| MARCH. | | | | | | APRIL. | | | | | |
|---------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|---------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| Noon. | Noon. | Noon. | Noon. | Noon. | | Noon. | Noon. | Noon. | Noon. | | |
| h m s | " | o ' " | " | h m | | h m s | s | o ' " | " | h m | |
| 1 | 21 42 55.15 | +15.682 | -15 50 57.6 | + 70.82 | 23 9.2 | 1 | 1 15 3.15 | +18.268 | + 8 2 21.5 | +140.48 | 0 36.9 |
| 2 | 21 49 12.52 | 15.765 | 15 21 59.0 | 74.07 | 23 11.6 | 2 | 1 22 20.52 | 18.173 | 8 58 12.4 | 138.68 | 0 40.3 |
| 3 | 21 55 31.87 | 15.847 | 14 51 42.4 | 77.32 | 23 14.0 | 3 | 1 29 35.08 | 18.033 | 9 53 13.5 | 136.32 | 0 43.6 |
| 4 | 22 1 53.18 | 15.928 | 14 20 7.8 | 80.56 | 23 16.4 | 4 | 1 36 45.71 | 17.844 | 10 47 11.0 | 133.39 | 0 46.8 |
| 5 | 22 8 10.42 | 16.009 | 13 47 15.5 | 83.80 | 23 18.9 | 5 | 1 43 51.20 | 17.604 | 11 39 51.4 | 129.29 | 0 49.9 |
| 6 | 22 14 41.61 | +16.090 | -13 13 5.7 | + 87.02 | 23 21.4 | 6 | 1 50 50.28 | +17.310 | +12 31 1.5 | +125.86 | 0 53.0 |
| 7 | 22 21 8.75 | 16.172 | 12 37 38.5 | 90.24 | 23 24.0 | 7 | 1 57 41.67 | 16.969 | 13 20 28.8 | 121.33 | 0 55.9 |
| 8 | 22 27 37.87 | 16.255 | 12 0 54.3 | 93.44 | 23 26.6 | 8 | 2 4 24.05 | 16.560 | 14 8 1.6 | 116.33 | 0 58.7 |
| 9 | 22 34 9.01 | 16.340 | 11 22 53.4 | 96.63 | 23 29.2 | 9 | 2 10 56.13 | 16.104 | 14 53 29.2 | 110.91 | 1 1.3 |
| 10 | 22 40 42.30 | 16.427 | 10 43 36.2 | 99.80 | 23 31.8 | 10 | 2 17 16.65 | 15.597 | 15 36 42.4 | 105.13 | 1 3.7 |
| 11 | 22 47 17.52 | +16.515 | -10 3 3.4 | +102.94 | 23 34.5 | 11 | 2 23 24.39 | +15.040 | +16 17 33.2 | + 99.05 | 1 5.8 |
| 12 | 22 53 55.04 | 16.610 | 9 21 15.5 | 106.06 | 23 37.2 | 12 | 2 29 18.21 | 14.437 | 16 55 54.9 | 92.72 | 1 7.8 |
| 13 | 23 0 34.83 | 16.706 | 8 38 13.0 | 109.14 | 23 40.0 | 13 | 2 34 57.01 | 13.790 | 17 31 42.1 | 86.19 | 1 9.5 |
| 14 | 23 7 16.97 | 16.806 | 7 53 57.0 | 112.19 | 23 42.8 | 14 | 2 40 19.78 | 13.101 | 18 4 50.6 | 79.50 | 1 10.9 |
| 15 | 23 14 1.54 | 16.909 | 7 8 28.4 | 115.18 | 23 45.6 | 15 | 2 45 25.56 | 12.375 | 18 35 17.2 | 72.70 | 1 12.0 |
| 16 | 23 20 48.64 | +17.016 | - 6 21 48.6 | +118.12 | 23 48.5 | 16 | 2 50 13.50 | +11.615 | +19 2 59.8 | + 65.83 | 1 12.9 |
| 17 | 23 27 38.35 | 17.127 | 5 33 58.9 | 121.00 | 23 51.5 | 17 | 2 54 42.80 | 10.822 | 19 27 56.6 | 58.90 | 1 13.4 |
| 18 | 23 34 30.76 | 17.241 | 4 45 1.2 | 123.80 | 23 54.6 | 18 | 2 58 52.72 | 10.000 | 19 50 6.8 | 51.95 | 1 13.6 |
| 19 | 23 41 25.94 | 17.358 | 3 54 57.5 | 126.49 | 23 57.6 | 19 | 3 2 42.59 | 9.152 | 20 9 30.0 | 44.98 | 1 13.5 |
| 20 | 23 48 23.93 | 17.477 | 3 3 50.4 | 129.08 | | 20 | 3 6 11.82 | 8.280 | 20 26 6.1 | 38.02 | 1 13.0 |
| 21 | 23 55 24.77 | +17.595 | - 2 11 42.8 | +131.53 | 0 0.6 | 21 | 3 9 19.89 | + 7.389 | +20 39 55.0 | + 31.06 | 1 12.2 |
| 22 | 0 2 28.46 | 17.713 | 1 18 38.3 | 133.82 | 0 3.7 | 22 | 3 12 6.38 | 6.482 | 20 50 57.2 | 24.19 | 1 11.0 |
| 23 | 0 9 34.97 | 17.829 | - 0 24 41.0 | 135.92 | 0 6.8 | 23 | 3 14 30.92 | 5.562 | 20 59 13.2 | 17.21 | 1 9.5 |
| 24 | 0 16 44.21 | 17.940 | + 0 30 4.2 | 137.81 | 0 10.0 | 24 | 3 16 33.28 | 4.634 | 21 4 43.6 | 10.33 | 1 7.6 |
| 25 | 0 23 56.05 | 18.045 | 1 25 31.8 | 139.44 | 0 13.3 | 25 | 3 18 13.33 | 3.704 | 21 7 29.3 | + 3.49 | 1 5.3 |
| 26 | 0 31 10.28 | +18.139 | + 2 21 35.2 | +140.79 | 0 16.6 | 26 | 3 19 31.09 | + 2.777 | +21 7 31.6 | - 3.98 | 1 2.6 |
| 27 | 0 38 26.63 | 18.220 | 3 18 7.0 | 141.80 | 0 20.0 | 27 | 3 20 26.71 | 1.861 | 21 4 52.3 | 9.98 | 0 59.6 |
| 28 | 0 45 44.71 | 18.283 | 4 14 58.7 | 142.44 | 0 23.3 | 28 | 3 21 0.55 | 0.962 | 20 59 33.5 | 16.57 | 0 56.2 |
| 29 | 0 53 4.04 | 18.324 | 5 12 0.9 | 142.66 | 0 26.7 | 29 | 3 21 13.12 | + 0.089 | 20 51 38.3 | 23.01 | 0 52.5 |
| 30 | 1 0 24.03 | 18.338 | 6 0 3.0 | 142.43 | 0 30.1 | 30 | 3 21 5.15 | - 0.748 | 20 41 10.6 | 29.36 | 0 48.4 |
| 31 | 1 7 44.01 | +18.321 | + 7 5 54.0 | +141.72 | 0 33.5 | 31 | 3 20 37.60 | - 1.540 | +20 28 15.6 | - 35.27 | 0 44.0 |
| 32 | 1 15 3.15 | +18.268 | + 8 2 21.5 | +140.48 | 0 36.9 | 32 | 3 19 51.68 | - 2.278 | +20 13 0.1 | - 40.97 | 0 39.2 |

| Day of the Month. | 2d. | 7th. | 12th. | 17th. | 22d. | 27th. | Day of the Month. | 1st. | 6th. | 11th. | 16th. | 21st. | 26th. |
|-------------------|-----|------|-------|-------|------|-------|-------------------|------|------|-------|-------|-------|-------|
| Semidiameter . . | 2.6 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | Semidiameter . . | 2.6 | 2.9 | 3.2 | 3.6 | 4.2 | 4.8 |
| Hor. Parallax . . | 6.9 | 6.7 | 6.6 | 6.5 | 6.5 | 6.7 | Hor. Parallax . . | 7.0 | 7.6 | 8.4 | 9.6 | 11.0 | 12.6 |

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

| GREENWICH MEAN TIME. | | | | | | | | | | | | |
|---|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|--|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|--|
| MAY. | | | | | | JUNE. | | | | | | |
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | | |
| | h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m | |
| 1 | 3 20 37.60 | -1.540 | +20 28 15.6 | -35.97 | 0 44.0 | 1 | 3 4 26.01 | + 6.683 | +13 25 46.6 | +31.30 | 22 24.6 | |
| 2 | 3 19 51.68 | 2.978 | 20 13 0.1 | 40.97 | 0 39.3 | 2 | 3 7 13.77 | 7.995 | 13 39 9.8 | 35.59 | 22 23.7 | |
| 3 | 3 18 48.78 | 2.952 | 19 55 32.0 | 46.30 | 0 34.3 | 3 | 3 10 16.11 | 7.998 | 13 54 13.0 | 39.63 | 22 23.0 | |
| 4 | 3 17 30.57 | 3.553 | 19 36 1.1 | 51.18 | 0 29.1 | 4 | 3 13 32.84 | 8.494 | 14 10 50.1 | 43.41 | 22 22.6 | |
| 5 | 3 15 58.89 | 4.073 | 19 14 39.5 | 55.52 | 0 23.6 | 5 | 3 17 3.78 | 9.084 | 14 28 54.4 | 46.93 | 22 22.4 | |
| 6 | 3 14 15.78 | -4.503 | +18 51 40.7 | -59.27 | 0 18.0 | 6 | 3 20 48.80 | + 9.668 | +14 48 20.1 | +50.18 | 22 22.4 | |
| 7 | 3 12 23.48 | 4.838 | 18 27 19.8 | 62.35 | 0 12.2 | 7 | 3 24 47.79 | 10.248 | 15 9 0.7 | 53.16 | 22 22.7 | |
| 8 | 3 10 24.31 | 5.075 | 18 1 54.0 | 64.67 | 0 6.3 | 8 | 3 29 0.67 | 10.825 | 15 30 49.6 | 55.87 | 22 23.2 | |
| 9 | 3 8 20.66 | 5.211 | 17 35 41.8 | 66.21 | 0 0.3 | 9 | 3 33 27.40 | 11.402 | 15 53 40.2 | 58.31 | 22 23.9 | |
| 10 | 3 6 14.95 | 5.246 | 17 9 2.6 | 66.92 | 23 48.3 | 10 | 3 38 7.96 | 11.979 | 16 17 26.1 | 60.47 | 22 24.8 | |
| 11 | 3 4 9.61 | -5.182 | +16 42 16.3 | -66.79 | 23 42.3 | 11 | 3 43 2.39 | +12.558 | +16 42 0.3 | +62.34 | 22 26.0 | |
| 12 | 3 2 6.95 | 5.093 | 16 15 43.3 | 65.83 | 23 36.4 | 12 | 3 48 10.74 | 13.139 | 17 7 15.9 | 63.92 | 22 27.4 | |
| 13 | 3 0 9.19 | 4.776 | 15 49 43.1 | 64.06 | 23 30.7 | 13 | 3 53 33.08 | 13.794 | 17 33 5.9 | 65.19 | 22 29.1 | |
| 14 | 2 58 18.34 | 4.447 | 15 24 34.4 | 61.53 | 23 25.0 | 14 | 3 59 9.52 | 14.314 | 17 59 22.6 | 66.15 | 22 31.0 | |
| 15 | 2 56 36.31 | 4.044 | 15 0 35.2 | 58.29 | 23 19.6 | 15 | 4 5 0.18 | 14.909 | 18 25 58.6 | 66.79 | 22 33.1 | |
| 16 | 2 55 4.75 | -3.576 | +14 38 1.4 | -54.42 | 23 14.3 | 16 | 4 11 5.18 | +15.509 | +18 52 45.6 | +67.07 | 22 35.5 | |
| 17 | 2 53 45.09 | 3.054 | 14 17 7.3 | 50.00 | 23 9.3 | 17 | 4 17 24.65 | 16.114 | 19 19 35.1 | 68.99 | 22 38.1 | |
| 18 | 2 52 38.55 | 2.485 | 13 58 4.9 | 45.13 | 23 4.5 | 18 | 4 23 58.69 | 16.794 | 19 46 18.3 | 69.54 | 22 40.9 | |
| 19 | 2 51 46.12 | 1.879 | 13 41 4.2 | 39.88 | 22 59.9 | 19 | 4 30 47.41 | 17.337 | 20 12 45.8 | 69.88 | 22 44.0 | |
| 20 | 2 51 8.60 | 1.244 | 13 26 13.2 | 34.35 | 22 55.6 | 20 | 4 37 50.85 | 17.950 | 20 38 47.7 | 64.40 | 22 47.4 | |
| 21 | 2 50 46.58 | -0.588 | +13 13 37.8 | -28.61 | 22 51.6 | 21 | 4 45 9.00 | +18.561 | +21 4 13.5 | +69.68 | 22 51.0 | |
| 22 | 2 50 40.49 | +0.082 | 13 3 21.6 | 22.74 | 22 47.6 | 22 | 4 52 41.75 | 19.167 | 21 28 52.4 | 60.49 | 22 54.8 | |
| 23 | 2 50 50.60 | 0.761 | 12 55 26.9 | 16.82 | 22 44.3 | 23 | 5 0 28.95 | 19.764 | 21 52 32.9 | 57.81 | 22 58.9 | |
| 24 | 2 51 17.04 | 1.443 | 12 49 54.4 | 10.90 | 22 41.0 | 24 | 5 8 30.31 | 20.345 | 22 15 3.1 | 54.63 | 23 3.2 | |
| 25 | 2 51 59.85 | 2.194 | 12 46 43.2 | - 5.05 | 22 38.1 | 25 | 5 16 45.35 | 20.904 | 22 36 11.2 | 50.95 | 23 7.8 | |
| 26 | 2 52 58.97 | +2.801 | +12 45 51.2 | + 0.69 | 22 35.4 | 26 | 5 25 13.49 | +21.436 | +22 55 44.8 | +46.77 | 23 12.5 | |
| 27 | 2 54 14.25 | 3.471 | 12 47 15.4 | 6.29 | 22 32.9 | 27 | 5 33 53.98 | 21.932 | 23 13 31.9 | 42.08 | 23 17.4 | |
| 28 | 2 55 45.53 | 4.133 | 12 50 52.0 | 11.79 | 22 30.7 | 28 | 5 42 45.86 | 22.384 | 23 29 20.7 | 36.91 | 23 22.5 | |
| 29 | 2 57 32.58 | 4.786 | 12 56 36.6 | 16.95 | 22 28.8 | 29 | 5 51 47.98 | 22.784 | 23 43 0.0 | 31.30 | 23 27.8 | |
| 30 | 2 59 35.18 | 5.498 | 13 4 24.2 | 21.97 | 22 27.2 | 30 | 6 0 59.05 | 23.198 | 23 54 19.7 | 25.28 | 23 33.2 | |
| 31 | 3 1 53.07 | +6.061 | +13 14 9.4 | +26.76 | 22 25.8 | 31 | 6 10 17.62 | +23.408 | +24 3 10.8 | +18.92 | 23 38.7 | |
| 32 | 3 4 26.01 | +6.683 | +13 25 46.6 | +31.30 | 22 24.6 | 32 | 6 19 42.09 | +23.619 | +24 9 25.7 | +19.28 | 23 44.2 | |
| Day of the Month. | | | | | | Day of the Month. | | | | | | |
| 1st. 6th. 11th. 16th. 21st. 26th. 31st. | | | | | | 5th. 10th. 15th. 20th. 25th. 30th. | | | | | | |
| Semidiameter . . 5.4 5.8 6.0 5.9 5.6 5.1 4.6 | | | | | | Semidiameter . . 4.1 3.7 3.3 3.0 2.8 2.6 | | | | | | |
| Hor. Parallax . . 14.2 15.5 16.0 15.7 14.7 13.4 12.1 | | | | | | Hor. Parallax . . 10.8 9.7 8.8 8.0 7.3 6.9 | | | | | | |
| NOTE.—The sign + indicates north declinations: the sign — indicates south declinations. | | | | | | | | | | | | |

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

| JULY. | | | | | | AUGUST. | | | | | | | |
|-------------------|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|---------------|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|-------|-------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | | |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | | | |
| | h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m | | |
| 1 | 6 10 17.62 | +23.408 | +24 3 10.8 | +18.93 | 23 38.7 | 1 | 10 15 50.72 | +13.805 | +11 22 15.1 | -99.15 | 1 36.7 | | |
| 2 | 6 19 42.09 | 23.619 | 24 9 25.7 | 12.98 | 23 44.2 | 2 | 10 21 17.76 | 13.449 | 10 42 35.8 | 90.10 | 1 38.2 | | |
| 3 | 6 29 10.78 | 23.759 | 24 12 58.4 | + 5.43 | 23 49.8 | 3 | 10 26 36.31 | 13.098 | 10 2 59.4 | 98.90 | 1 39.6 | | |
| 4 | 6 38 41.96 | 23.896 | 24 13 45.3 | - 1.54 | 23 55.4 | 4 | 10 31 46.46 | 12.749 | 9 23 29.7 | 98.55 | 1 40.8 | | |
| 5 | 6 48 13.87 | 23.891 | 24 11 44.2 | 8.56 | | 5 | 10 36 48.25 | 12.402 | 8 44 10.4 | 98.04 | 1 41.9 | | |
| 6 | 6 57 44.82 | +23.746 | +24 6 54.8 | -15.54 | 0 1.0 | 6 | 10 41 41.73 | +12.056 | + 8 5 5.1 | -97.38 | 1 42.8 | | |
| 7 | 7 7 13.19 | 23.606 | 23 59 19.0 | 22.42 | 0 6.6 | 7 | 10 46 26.90 | 11.709 | 7 26 17.5 | 96.56 | 1 43.6 | | |
| 8 | 7 16 37.45 | 23.406 | 23 49 0.3 | 29.19 | 0 12.1 | 8 | 10 51 3.74 | 11.361 | 6 47 51.3 | 95.59 | 1 44.3 | | |
| 9 | 7 25 56.25 | 23.152 | 23 36 3.6 | 35.58 | 0 17.5 | 9 | 10 55 32.19 | 11.009 | 6 9 50.2 | 94.47 | 1 44.8 | | |
| 10 | 7 35 8.35 | 22.850 | 23 20 34.8 | 41.77 | 0 22.7 | 10 | 10 59 52.16 | 10.654 | 5 32 18.0 | 93.19 | 1 45.2 | | |
| 11 | 7 44 12.73 | +22.509 | +23 2 41.2 | -47.64 | 0 27.9 | 11 | 11 4 3.53 | +10.293 | + 4 55 18.4 | -91.75 | 1 45.4 | | |
| 12 | 7 53 8.50 | 22.134 | 22 42 30.8 | 53.17 | 0 32.9 | 12 | 11 8 6.16 | 9.924 | 4 18 55.4 | 90.14 | 1 45.5 | | |
| 13 | 8 1 54.94 | 21.733 | 22 20 11.7 | 58.36 | 0 37.7 | 13 | 11 11 59.83 | 9.546 | 3 43 13.3 | 88.35 | 1 45.4 | | |
| 14 | 8 10 31.50 | 21.312 | 21 55 52.5 | 63.18 | 0 42.4 | 14 | 11 15 44.30 | 9.158 | 3 8 16.4 | 86.37 | 1 45.2 | | |
| 15 | 8 18 57.78 | 20.876 | 21 29 42.1 | 67.63 | 0 46.9 | 15 | 11 19 19.31 | 8.757 | 2 34 9.2 | 84.20 | 1 44.9 | | |
| 16 | 8 27 13.47 | +20.430 | +21 1 48.9 | -71.73 | 0 51.2 | 16 | 11 22 44.51 | + 8.341 | + 2 0 56.6 | -81.82 | 1 44.3 | | |
| 17 | 8 35 18.38 | 19.978 | 20 32 21.6 | 75.48 | 0 55.4 | 17 | 11 25 59.54 | 7.909 | 1 28 43.6 | 79.22 | 1 43.6 | | |
| 18 | 8 43 12.43 | 19.526 | 20 1 28.4 | 78.89 | 0 59.3 | 18 | 11 29 3.98 | 7.458 | 0 57 35.7 | 76.39 | 1 42.7 | | |
| 19 | 8 50 55.62 | 19.074 | 19 29 17.3 | 81.98 | 1 3.1 | 19 | 11 31 57.35 | 6.996 | + 0 27 38.8 | 73.31 | 1 41.7 | | |
| 20 | 8 58 27.98 | 18.624 | 18 55 55.8 | 84.76 | 1 6.7 | 20 | 11 34 39.14 | 6.491 | - 0 1 0.9 | 69.95 | 1 40.4 | | |
| 21 | 9 5 49.61 | +16.180 | +18 21 31.2 | -87.24 | 1 10.1 | 21 | 11 37 8.74 | + 5.971 | - 0 28 16.7 | -66.31 | 1 38.9 | | |
| 22 | 9 13 0.67 | 17.742 | 17 46 10.3 | 89.45 | 1 13.4 | 22 | 11 39 25.54 | 5.494 | 0 54 1.4 | 62.36 | 1 37.3 | | |
| 23 | 9 20 1.31 | 17.312 | 17 9 59.7 | 91.39 | 1 16.4 | 23 | 11 41 28.84 | 4.847 | 1 18 7.2 | 58.06 | 1 35.4 | | |
| 24 | 9 26 51.73 | 16.890 | 16 33 5.4 | 93.09 | 1 19.3 | 24 | 11 43 17.92 | 4.238 | 1 40 25.5 | 53.40 | 1 33.3 | | |
| 25 | 9 33 32.11 | 16.476 | 15 55 33.3 | 94.55 | 1 22.1 | 25 | 11 44 51.98 | 3.595 | 2 0 47.3 | 48.35 | 1 30.9 | | |
| 26 | 9 40 2.66 | +16.071 | +15 17 28.9 | -95.79 | 1 24.6 | 26 | 11 46 10.19 | + 2.917 | - 2 19 3.2 | -42.89 | 1 28.2 | | |
| 27 | 9 46 23.60 | 15.675 | 14 38 57.3 | 96.82 | 1 27.0 | 27 | 11 47 11.72 | 2.904 | 2 35 2.7 | 36.99 | 1 25.3 | | |
| 28 | 9 52 35.13 | 15.267 | 14 0 3.4 | 97.64 | 1 29.3 | 28 | 11 47 55.70 | 1.455 | 2 48 35.0 | 30.02 | 1 22.1 | | |
| 29 | 9 58 37.44 | 14.907 | 13 20 51.9 | 98.28 | 1 31.4 | 29 | 11 48 21.28 | + 0.671 | 2 59 28.7 | 23.77 | 1 18.5 | | |
| 30 | 10 4 36.70 | 14.533 | 12 41 27.2 | 98.74 | 1 33.3 | 30 | 11 48 27.66 | - 0.145 | 3 7 32.0 | 16.42 | 1 14.7 | | |
| 31 | 10 10 15.07 | +14.166 | +12 1 53.5 | -99.03 | 1 35.1 | 31 | 11 48 14.07 | - 0.990 | - 3 12 32.8 | - 8.57 | 1 10.5 | | |
| 32 | 10 15 50.72 | +13.805 | +11 22 15.1 | -99.15 | 1 36.7 | 32 | 11 47 39.90 | - 1.859 | - 3 14 19.5 | - 0.94 | 1 6.0 | | |
| | | | | | | | | | | | | | |
| Day of the Month. | 5th. | 10th. | 15th. | 20th. | 25th. | 30th. | Day of the Month. | 4th. | 9th. | 14th. | 19th. | 24th. | 29th. |
| Semidiameter . . | 2.5 | 2.5 | 2.5 | 2.6 | 2.7 | 2.9 | Semidiameter . . | 3.1 | 3.3 | 3.5 | 3.8 | 4.2 | 4.5 |
| Hor. Parallax . . | 6.7 | 6.7 | 6.8 | 7.0 | 7.3 | 7.7 | Hor. Parallax . . | 8.1 | 8.7 | 9.3 | 10.1 | 11.0 | 12.0 |

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

| SEPTEMBER. | | | | | | OCTOBER. | | | | | |
|----------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|----------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| Noon. | Noon. | Noon. | Noon. | Noon. | | Noon. | Noon. | Noon. | Noon. | Noon. | |
| h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m | |
| 1 11 47 39.90 | -1.859 | -3 14 19.5 | -0.94 | 1 6.0 | | 1 11 27 41.99 | +19.153 | + 5 10 30.1 | -57.79 | 22 49.0 | |
| 2 11 46 44.71 | 2.743 | 3 12 40.7 | +8.55 | 1 1.1 | | 2 11 32 42.36 | 12.860 | 4 45 42.4 | 66.05 | 22 50.3 | |
| 3 11 45 28.25 | 3.629 | 3 7 26.1 | 17.74 | 0 55.9 | | 3 11 37 58.44 | 13.464 | 4 17 46.4 | 73.49 | 22 51.8 | |
| 4 11 43 50.02 | 4.505 | 2 58 27.0 | 27.23 | 0 50.4 | | 4 11 43 27.85 | 13.972 | 3 47 1.5 | 80.12 | 22 53.5 | |
| 5 11 41 52.25 | 5.353 | 2 45 37.7 | 36.91 | 0 44.5 | | 5 11 49 8.40 | 14.393 | 3 13 47.1 | 85.95 | 22 55.4 | |
| 6 11 39 34.05 | -6.154 | -2 28 55.1 | +46.63 | 0 38.2 | | 6 11 54 58.11 | +14.737 | + 2 38 22.0 | -91.02 | 22 57.4 | |
| 7 11 36 57.45 | 6.883 | 2 8 21.0 | 56.17 | 0 31.7 | | 7 12 0 55.23 | 15.012 | 2 1 3.9 | 95.38 | 22 59.6 | |
| 8 11 34 4.46 | 7.515 | 1 44 2.2 | 65.31 | 0 24.9 | | 8 12 6 58.21 | 15.227 | 1 22 9.4 | 99.06 | 23 1.8 | |
| 9 11 30 57.71 | 8.025 | 1 16 11.5 | 73.78 | 0 17.9 | | 9 12 13 5.71 | 15.391 | 0 41 54.2 | 102.12 | 23 4.0 | |
| 10 11 27 40.42 | 8.388 | 0 45 8.6 | 81.98 | 0 10.7 | | 10 12 19 16.62 | 15.512 | + 0 0 32.5 | 104.60 | 23 6.3 | |
| 11 11 24 16.45 | -8.578 | -0 11 20.0 | +87.53 | 0 3 56.0 | | 11 12 25 30.00 | +15.598 | - 0 41 42.6 | -106.58 | 23 8.6 | |
| 12 11 20 50.17 | 8.578 | +0 24 41.2 | 92.98 | 23 48.7 | | 12 12 31 45.08 | 15.654 | 1 24 39.7 | 108.10 | 23 10.9 | |
| 13 11 17 26.31 | 8.374 | 1 2 15.8 | 95.29 | 23 41.5 | | 13 12 38 1.22 | 15.688 | 2 8 8.0 | 109.30 | 23 13.2 | |
| 14 11 14 9.91 | 7.957 | 1 40 39.9 | 93.39 | 23 34.6 | | 14 12 44 17.93 | 15.702 | 2 51 58.3 | 109.93 | 23 15.6 | |
| 15 11 11 6.04 | 7.331 | 2 19 6.9 | 95.50 | 23 27.9 | | 15 12 50 34.81 | 15.702 | 3 36 2.1 | 110.33 | 23 17.9 | |
| 16 11 8 19.60 | -6.506 | +2 56 48.4 | +92.62 | 23 21.5 | | 16 12 56 51.57 | +15.692 | - 4 20 11.9 | -110.44 | 23 20.2 | |
| 17 11 5 55.19 | 5.499 | 3 32 57.6 | 87.83 | 23 15.6 | | 17 13 3 7.08 | 15.675 | 5 4 21.1 | 110.29 | 23 22.6 | |
| 18 11 3 56.89 | 4.334 | 4 6 50.3 | 81.27 | 23 10.2 | | 18 13 9 23.92 | 15.652 | 5 48 24.1 | 109.92 | 23 24.9 | |
| 19 11 2 28.18 | 3.039 | 4 37 46.2 | 73.15 | 23 5.3 | | 19 13 15 39.28 | 15.627 | 6 32 15.5 | 109.34 | 23 27.2 | |
| 20 11 1 31.78 | 1.647 | 5 5 10.9 | 63.72 | 23 1.0 | | 20 13 21 54.02 | 15.601 | 7 15 50.8 | 108.58 | 23 29.5 | |
| 21 11 1 9.63 | -0.191 | +5 28 36.1 | +53.24 | 22 57.3 | | 21 13 28 8.12 | +15.575 | - 7 59 6.0 | -107.66 | 23 31.8 | |
| 22 11 1 22.86 | +1.296 | 5 47 40.0 | 41.98 | 22 54.2 | | 22 13 34 21.63 | 15.551 | 8 41 57.4 | 106.00 | 23 34.1 | |
| 23 11 2 11.84 | 2.783 | 6 2 7.0 | 30.21 | 22 51.6 | | 23 13 40 34.57 | 15.526 | 9 24 21.7 | 105.41 | 23 36.3 | |
| 24 11 3 36.22 | 4.242 | 6 11 48.1 | 18.19 | 22 49.6 | | 24 13 46 47.01 | 15.509 | 10 6 16.2 | 104.11 | 23 38.6 | |
| 25 11 5 35.04 | 5.649 | 6 16 39.8 | +6.12 | 22 48.2 | | 25 13 52 59.03 | 15.493 | 10 47 38.1 | 102.70 | 23 40.9 | |
| 26 11 8 6.80 | +6.984 | +6 16 43.2 | -5.79 | 22 47.2 | | 26 13 59 10.71 | +15.481 | -11 28 25.0 | -101.20 | 23 43.1 | |
| 27 11 11 9.55 | 8.220 | 6 12 4.7 | 17.36 | 22 46.8 | | 27 14 5 22.15 | 15.474 | 12 8 34.8 | 99.61 | 23 45.3 | |
| 28 11 14 41.01 | 9.375 | 6 2 53.9 | 26.45 | 22 46.8 | | 28 14 11 33.48 | 15.471 | 12 48 5.5 | 97.94 | 23 47.6 | |
| 29 11 18 38.67 | 10.412 | 5 49 23.9 | 38.95 | 22 47.2 | | 29 14 17 44.78 | 15.472 | 13 26 55.2 | 96.19 | 23 49.9 | |
| 30 11 22 59.88 | 11.338 | 5 31 50.1 | 48.75 | 22 47.9 | | 30 14 23 56.15 | 15.478 | 14 5 2.3 | 94.38 | 23 52.1 | |
| 31 11 27 41.99 | +12.153 | +5 10 30.1 | -57.79 | 22 49.0 | | 31 14 30 7.74 | +15.468 | -14 42 25.1 | -93.51 | 23 54.4 | |
| 32 11 32 42.36 | +12.860 | +4 45 42.4 | -66.05 | 22 50.3 | | 32 14 36 19.62 | +15.503 | -15 19 2.2 | -93.57 | 23 56.6 | |

| Day of the Month. | 3d. | 8th. | 13th. | 18th. | 23d. | 28th. | Day of the Month. | 3d. | 8th. | 13th. | 18th. | 23d. | 28th. |
|-------------------|------|------|-------|-------|------|-------|-------------------|-----|------|-------|-------|------|-------|
| Semidiameter . . | 4.9 | 5.2 | 5.2 | 4.8 | 4.1 | 3.5 | Semidiameter . . | 3.1 | 2.8 | 2.6 | 2.4 | 2.4 | 2.3 |
| Hor. Parallax . . | 13.1 | 13.8 | 13.7 | 12.6 | 11.0 | 9.4 | Hor. Parallax . . | 8.2 | 7.4 | 6.8 | 6.5 | 6.3 | 6.2 |

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

| NOVEMBER. | | | | | | DECEMBER. | | | | | | | | |
|---------------------|--|---------------------------|--|---------------------------|---------------------------|---------------|--|---------------------------|--|---------------------------|---------------------------|------|-------|------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | | | |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | | | | |
| | ^h ^m ^s | ^s | [°] ['] ["] | ["] | ^h ^m | | ^h ^m ^s | ^s | [°] ['] ["] | ["] | ^h ^m | | | |
| 1 | 14 36 19.62 | +15.503 | -15 19 2.2 | -90.57 | 23 56.6 | 1 | 17 47 25.27 | +15.632 | -25 48 35.0 | -5.88 | 1 7.3 | | | |
| 2 | 14 42 31.90 | 15.521 | 15 54 51.9 | 88.56 | 23 58.9 | 2 | 17 53 38.20 | 15.440 | 25 50 12.7 | -2.27 | 1 9.6 | | | |
| 3 | 14 48 44.67 | 15.544 | 16 29 52.7 | 86.50 | | 3 | 17 59 46.06 | 15.208 | 25 50 23.7 | +1.35 | 1 11.8 | | | |
| 4 | 14 54 58.06 | 15.571 | 17 4 3.3 | 84.28 | 0 1.2 | 4 | 18 5 47.82 | 14.932 | 25 49 8.0 | 4.96 | 1 13.8 | | | |
| 5 | 15 1 12.11 | 15.601 | 17 37 22.5 | 82.21 | 0 3.5 | 5 | 18 11 42.38 | 14.606 | 25 46 25.9 | 8.55 | 1 15.8 | | | |
| 6 | 15 7 26.94 | +15.635 | -18 9 48.8 | -79.96 | 0 5.8 | 6 | 18 17 28.43 | +14.222 | -25 42 18.1 | +12.10 | 1 17.6 | | | |
| 7 | 15 13 42.60 | 15.671 | 18 41 21.0 | 77.69 | 0 8.1 | 7 | 18 23 4.52 | 13.774 | 25 36 45.8 | 15.58 | 1 19.3 | | | |
| 8 | 15 19 59.18 | 15.710 | 19 11 57.7 | 75.35 | 0 10.5 | 8 | 18 28 28.99 | 13.253 | 25 29 50.7 | 18.99 | 1 20.7 | | | |
| 9 | 15 26 16.72 | 15.752 | 19 41 37.6 | 72.96 | 0 12.8 | 9 | 18 33 40.00 | 12.648 | 25 21 35.3 | 22.27 | 1 22.0 | | | |
| 10 | 15 32 35.28 | 15.795 | 20 10 19.3 | 70.51 | 0 15.2 | 10 | 18 38 35.38 | 11.922 | 25 12 2.8 | 25.41 | 1 23.0 | | | |
| 11 | 15 38 54.89 | +15.839 | -20 38 1.7 | -68.01 | 0 17.6 | 11 | 18 43 12.87 | +11.154 | -25 1 16.9 | +28.38 | 1 23.6 | | | |
| 12 | 15 45 15.57 | 15.885 | 21 4 43.4 | 65.45 | 0 20.0 | 12 | 18 47 29.85 | 10.241 | 24 49 22.5 | 31.12 | 1 23.9 | | | |
| 13 | 15 51 37.35 | 15.930 | 21 30 22.8 | 62.83 | 0 22.4 | 13 | 18 51 23.44 | 9.202 | 24 36 25.4 | 33.60 | 1 23.8 | | | |
| 14 | 15 58 0.22 | 15.975 | 21 54 58.7 | 60.16 | 0 24.8 | 14 | 18 54 50.47 | 8.027 | 24 22 32.3 | 35.78 | 1 23.3 | | | |
| 15 | 16 4 24.16 | 16.019 | 22 18 30.0 | 57.43 | 0 27.3 | 15 | 18 57 47.58 | 6.707 | 24 7 50.6 | 37.63 | 1 22.3 | | | |
| 16 | 16 10 49.14 | +16.062 | -22 40 55.0 | -54.64 | 0 29.8 | 16 | 19 0 11.18 | +5.234 | -23 52 29.0 | +39.10 | 1 20.7 | | | |
| 17 | 16 17 15.10 | 16.102 | 23 2 12.3 | 51.79 | 0 32.3 | 17 | 19 1 57.57 | 3.808 | 23 36 36.8 | 40.17 | 1 18.5 | | | |
| 18 | 16 23 41.97 | 16.138 | 23 22 20.4 | 48.88 | 0 34.8 | 18 | 19 3 3.07 | +1.898 | 23 20 23.8 | 40.83 | 1 15.6 | | | |
| 19 | 16 30 9.67 | 16.169 | 23 41 18.1 | 45.91 | 0 37.3 | 19 | 19 3 24.24 | -0.086 | 23 4 0.1 | 41.07 | 1 12.0 | | | |
| 20 | 16 36 38.05 | 16.195 | 23 50 3.8 | 42.88 | 0 39.9 | 20 | 19 2 58.09 | 2.110 | 22 47 35.7 | 40.89 | 1 7.6 | | | |
| 21 | 16 43 6.96 | +16.214 | -24 15 36.0 | -39.79 | 0 42.4 | 21 | 19 1 42.39 | -4.206 | -22 31 20.5 | +40.32 | 1 2.4 | | | |
| 22 | 16 49 36.24 | 16.225 | 24 30 53.3 | 36.64 | 0 44.9 | 22 | 18 59 36.09 | 6.316 | 22 15 23.1 | 39.41 | 0 56.3 | | | |
| 23 | 16 56 5.66 | 16.227 | 24 44 54.3 | 33.43 | 0 47.5 | 23 | 18 56 39.71 | 8.266 | 21 59 51.3 | 38.19 | 0 49.5 | | | |
| 24 | 17 2 34.96 | 16.217 | 24 57 37.6 | 30.17 | 0 50.1 | 24 | 18 52 55.68 | 10.271 | 21 44 52.2 | 36.69 | 0 41.8 | | | |
| 25 | 17 9 3.87 | 16.192 | 25 9 1.8 | 26.84 | 0 52.6 | 25 | 18 48 28.61 | 11.937 | 21 30 32.4 | 34.92 | 0 33.4 | | | |
| 26 | 17 15 32.02 | +16.152 | -25 19 5.4 | -23.46 | 0 55.1 | 26 | 18 43 25.35 | -13.271 | -21 16 58.5 | +32.87 | 0 24.5 | | | |
| 27 | 17 21 59.02 | 16.095 | 25 27 47.3 | 20.03 | 0 57.6 | 27 | 18 37 54.82 | 14.196 | 21 4 17.4 | 30.50 | 0 15.1 | | | |
| 28 | 17 28 24.41 | 16.017 | 25 35 6.2 | 16.55 | 1 0.1 | 28 | 18 32 7.50 | 14.663 | 20 52 37.4 | 27.76 | 0 5.7 | | | |
| 29 | 17 34 47.66 | 15.915 | 25 41 1.1 | 13.02 | 1 2.6 | 29 | 18 26 14.80 | 14.646 | 20 42 8.1 | 24.60 | 23 46.1 | | | |
| 30 | 17 41 8.16 | 15.788 | 25 45 30.9 | 9.46 | 1 5.0 | 30 | 18 20 28.16 | 14.164 | 20 32 59.8 | 21.02 | 23 36.7 | | | |
| 31 | 17 47 25.27 | +15.632 | -25 48 35.0 | -5.88 | 1 7.3 | 31 | 18 14 58.22 | -13.265 | -20 25 22.6 | +17.02 | 23 27.7 | | | |
| 32 | 17 53 38.20 | +15.440 | -25 50 12.7 | -2.27 | 1 9.6 | 32 | 18 9 54.20 | -12.019 | -20 19 25.7 | +12.68 | 23 19.2 | | | |
| Day of the Month. | 2d. | 7th. | 12th. | 17th. | 22d. | 27th. | Day of the Month. | 2d. | 7th. | 12th. | 17th. | 22d. | 27th. | 32d. |
| Semidiameter . . . | 2.3 | 2.3 | 2.4 | 2.4 | 2.5 | 2.6 | Semidiameter . . | 2.8 | 3.1 | 3.4 | 3.9 | 4.5 | 4.9 | 4.9 |
| Hor. Parallax . . . | 6.1 | 6.2 | 6.2 | 6.4 | 6.6 | 6.9 | Hor. Parallax . . | 7.4 | 8.1 | 9.0 | 10.3 | 11.9 | 13.0 | 12.9 |

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

| JANUARY. | | | | | | FEBRUARY. | | | | | | | |
|-------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|---------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|-------|-------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | | |
| Noon. | Noon. | Noon. | Noon. | Noon. | Noon. | Noon. | Noon. | Noon. | Noon. | Noon. | Noon. | | |
| h m s | s | ° ' " | " | h m | h m s | s | ° ' " | " | h m | h m s | s | | |
| 1 | 16 18 0.38 | +3.156 | -16 49 19.1 | + 2.08 | 21 32.3 | 1 | 17 43 58.51 | + 9.615 | -19 13 14.5 | -12.70 | 20 58.2 | | |
| 2 | 16 19 20.13 | 3.486 | 16 48 51.0 | + 0.29 | 21 29.8 | 2 | 17 47 50.66 | 9.731 | 19 18 12.1 | 12.09 | 20 58.2 | | |
| 3 | 16 20 47.66 | 3.805 | 16 49 4.5 | - 1.40 | 21 27.4 | 3 | 17 51 45.54 | 9.843 | 19 22 54.5 | 11.43 | 20 58.2 | | |
| 4 | 16 22 22.74 | 4.115 | 16 49 57.4 | 2.99 | 21 25.2 | 4 | 17 55 43.05 | 9.949 | 19 27 20.6 | 10.73 | 20 58.3 | | |
| 5 | 16 24 5.12 | 4.414 | 16 51 27.2 | 4.48 | 21 23.1 | 5 | 17 59 43.08 | 10.052 | 19 31 29.3 | 9.98 | 20 58.4 | | |
| 6 | 16 25 54.56 | +4.703 | -16 53 31.6 | - 5.87 | 21 21.0 | 6 | 18 3 45.54 | +10.151 | -19 35 19.6 | - 9.19 | 20 58.5 | | |
| 7 | 16 27 50.81 | 4.982 | 16 56 8.0 | 7.15 | 21 19.1 | 7 | 18 7 50.32 | 10.246 | 19 38 50.5 | 8.37 | 20 58.7 | | |
| 8 | 16 29 53.61 | 5.252 | 16 59 14.2 | 8.34 | 21 17.3 | 8 | 18 11 57.33 | 10.337 | 19 42 1.1 | 7.51 | 20 58.9 | | |
| 9 | 16 32 2.82 | 5.519 | 17 2 47.7 | 9.43 | 21 15.6 | 9 | 18 16 6.46 | 10.424 | 19 44 50.5 | 6.61 | 20 59.2 | | |
| 10 | 16 34 18.14 | 5.763 | 17 6 46.3 | 10.43 | 21 14.0 | 10 | 18 20 17.64 | 10.507 | 19 47 18.0 | 5.68 | 20 59.5 | | |
| 11 | 16 36 39.38 | +6.005 | -17 11 7.8 | -11.33 | 21 12.5 | 11 | 18 24 30.76 | +10.586 | -19 49 22.8 | - 4.72 | 20 59.8 | | |
| 12 | 16 39 6.31 | 6.239 | 17 15 49.9 | 12.15 | 21 11.1 | 12 | 18 28 45.74 | 10.662 | 19 51 4.1 | 3.72 | 21 0.1 | | |
| 13 | 16 41 38.82 | 6.465 | 17 20 50.5 | 12.88 | 21 9.8 | 13 | 18 33 2.50 | 10.734 | 19 52 21.1 | 2.70 | 21 0.5 | | |
| 14 | 16 44 16.64 | 6.684 | 17 26 7.4 | 13.52 | 21 8.5 | 14 | 18 37 20.95 | 10.802 | 19 53 13.3 | 1.65 | 21 0.9 | | |
| 15 | 16 46 59.61 | 6.895 | 17 31 38.5 | 14.08 | 21 7.3 | 15 | 18 41 41.01 | 10.868 | 19 53 40.0 | - 0.57 | 21 1.3 | | |
| 16 | 16 49 47.58 | +7.100 | -17 37 22.0 | -14.55 | 21 6.3 | 16 | 18 46 2.61 | +10.939 | -19 53 40.7 | + 0.53 | 21 1.7 | | |
| 17 | 16 52 40.37 | 7.298 | 17 43 16.0 | 14.95 | 21 5.3 | 17 | 18 50 25.68 | 10.990 | 19 53 14.7 | 1.65 | 21 2.2 | | |
| 18 | 16 55 37.84 | 7.480 | 17 49 18.4 | 15.26 | 21 4.4 | 18 | 18 54 50.13 | 11.046 | 19 52 21.6 | 2.79 | 21 2.7 | | |
| 19 | 16 58 39.83 | 7.676 | 17 55 27.6 | 15.50 | 21 3.6 | 19 | 18 59 15.89 | 11.100 | 19 51 0.9 | 3.95 | 21 3.2 | | |
| 20 | 17 1 46.21 | 7.855 | 18 1 41.7 | 15.67 | 21 2.8 | 20 | 19 3 42.90 | 11.150 | 19 49 12.1 | 5.13 | 21 3.7 | | |
| 21 | 17 4 56.82 | +8.028 | -18 7 59.0 | -15.77 | 21 2.1 | 21 | 19 8 11.08 | +11.198 | -19 46 54.8 | + 6.32 | 21 4.2 | | |
| 22 | 17 8 11.51 | 8.197 | 18 14 17.9 | 15.80 | 21 1.5 | 22 | 19 12 40.37 | 11.242 | 19 44 8.7 | 7.53 | 21 4.7 | | |
| 23 | 17 11 30.25 | 8.360 | 18 20 36.8 | 15.76 | 21 0.9 | 23 | 19 17 10.70 | 11.284 | 19 40 53.3 | 8.75 | 21 5.3 | | |
| 24 | 17 14 52.82 | 8.519 | 18 26 54.0 | 15.66 | 21 0.4 | 24 | 19 21 41.99 | 11.323 | 19 37 8.4 | 9.99 | 21 5.9 | | |
| 25 | 17 18 19.14 | 8.673 | 18 33 8.0 | 15.50 | 20 59.9 | 25 | 19 26 14.19 | 11.359 | 19 32 53.7 | 11.24 | 21 6.5 | | |
| 26 | 17 21 49.09 | +8.822 | -18 39 17.2 | -15.27 | 20 59.5 | 26 | 19 30 47.22 | +11.392 | -19 28 9.0 | +12.50 | 21 7.1 | | |
| 27 | 17 25 22.55 | 8.966 | 18 45 20.3 | 14.98 | 20 59.2 | 27 | 19 35 21.03 | 11.423 | 19 22 54.0 | 13.76 | 21 7.8 | | |
| 28 | 17 28 59.40 | 9.105 | 18 51 15.7 | 14.63 | 20 58.9 | 28 | 19 39 55.53 | 11.451 | 19 17 8.6 | 15.03 | 21 8.4 | | |
| 29 | 17 32 39.53 | 9.239 | 18 57 2.2 | 14.23 | 20 58.7 | 29 | 19 44 30.66 | 11.476 | 19 10 52.6 | 16.31 | 21 9.1 | | |
| 30 | 17 36 22.83 | 9.369 | 19 2 38.4 | 13.77 | 20 58.5 | 30 | 19 49 6.36 | 11.498 | 19 4 5.9 | 17.59 | 21 9.8 | | |
| 31 | 17 40 9.19 | +9.494 | -19 8 2.9 | -13.26 | 20 58.3 | 31 | 19 53 42.56 | +11.518 | -18 56 48.3 | +18.88 | 21 10.5 | | |
| 32 | 17 43 58.51 | +9.615 | -19 13 14.5 | -12.70 | 20 58.2 | 32 | 19 58 19.18 | +11.535 | -18 48 59.8 | +20.16 | 21 11.2 | | |
| | | | | | | | | | | | | | |
| Day of the Month. | 1st. | 6th. | 11th. | 16th. | 21st. | 26th. | 31st. | Day of the Month. | 5th. | 10th. | 15th. | 20th. | 25th. |
| Semidiameter . . | 23.5 | 21.6 | 19.9 | 18.4 | 17.0 | 15.9 | 14.8 | Semidiameter | 13.9 | 13.1 | 12.4 | 11.7 | 11.1 |
| Hor. Parallax . . | 24.3 | 22.4 | 20.6 | 19.0 | 17.6 | 16.4 | 15.4 | Hor. Parallax | 14.4 | 13.6 | 12.8 | 12.1 | 11.5 |

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

| MARCH. | | | | | | APRIL. | | | | | | | | | |
|-------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|---------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|-------|-------|-------|-------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | | | | |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | | | | | |
| | h m s | s | ° ' " | " | | | h m | h m s | s | ° ' " | | " | h m | | |
| 1 | 19 44 30.66 | +11.476 | -19 10 52.6 | +16.31 | 21 9.1 | 1 | 22 7 8.64 | +11.316 | -11 54 25.2 | +59.00 | 21 20.5 | | | | |
| 2 | 19 49 6.36 | 11.498 | 19 4 5.9 | 17.59 | 21 9.8 | 2 | 22 11 40.00 | 11.297 | 11 33 26.7 | 59.88 | 21 30.0 | | | | |
| 3 | 19 53 42.56 | 11.518 | 18 56 48.3 | 18.88 | 21 10.5 | 3 | 22 16 10.91 | 11.278 | 11 12 7.3 | 53.74 | 21 30.6 | | | | |
| 4 | 19 58 19.18 | 11.535 | 18 48 59.8 | 20.16 | 21 11.2 | 4 | 22 20 41.37 | 11.260 | 10 50 27.7 | 54.57 | 21 31.1 | | | | |
| 5 | 20 2 56.17 | 11.549 | 18 40 40.3 | 21.45 | 21 11.9 | 5 | 22 25 11.37 | 11.241 | 10 28 28.4 | 55.38 | 21 31.7 | | | | |
| 6 | 20 7 33.49 | +11.560 | -18 31 50.1 | +22.73 | 21 12.6 | 6 | 22 29 40.92 | +11.222 | -10 6 10.0 | +56.16 | 21 32.2 | | | | |
| 7 | 20 12 11.05 | 11.569 | 18 22 29.2 | 24.01 | 21 13.2 | 7 | 22 34 10.01 | 11.203 | 9 43 33.1 | 56.92 | 21 32.8 | | | | |
| 8 | 20 16 48.80 | 11.575 | 18 12 37.8 | 25.28 | 21 13.9 | 8 | 22 38 38.65 | 11.184 | 9 20 38.3 | 57.65 | 21 33.3 | | | | |
| 9 | 20 21 26.70 | 11.580 | 18 2 16.0 | 26.54 | 21 14.5 | 9 | 22 43 6.85 | 11.166 | 8 57 26.3 | 58.35 | 21 33.8 | | | | |
| 10 | 20 26 4.66 | 11.582 | 17 51 23.9 | 27.80 | 21 15.2 | 10 | 22 47 34.62 | 11.148 | 8 33 57.7 | 59.03 | 21 34.3 | | | | |
| 11 | 20 30 42.66 | +11.583 | -17 40 1.7 | +29.05 | 21 15.9 | 11 | 22 52 1.96 | +11.131 | -8 10 13.1 | +59.68 | 21 34.9 | | | | |
| 12 | 20 35 20.65 | 11.581 | 17 28 9.6 | 30.29 | 21 16.6 | 12 | 22 56 28.90 | 11.114 | 7 46 13.0 | 60.31 | 21 35.4 | | | | |
| 13 | 20 39 58.58 | 11.578 | 17 15 47.7 | 31.52 | 21 17.2 | 13 | 23 0 55.43 | 11.098 | 7 21 58.2 | 60.91 | 21 35.9 | | | | |
| 14 | 20 44 36.40 | 11.573 | 17 2 56.5 | 32.74 | 21 17.9 | 14 | 23 5 21.59 | 11.080 | 6 57 29.2 | 61.49 | 21 36.4 | | | | |
| 15 | 20 49 14.09 | 11.567 | 16 49 36.2 | 33.95 | 21 18.6 | 15 | 23 9 47.38 | 11.068 | 6 32 46.7 | 62.04 | 21 36.9 | | | | |
| 16 | 20 53 51.60 | +11.559 | -16 35 47.0 | +35.14 | 21 19.3 | 16 | 23 14 12.84 | +11.054 | -6 7 51.4 | +62.57 | 21 37.3 | | | | |
| 17 | 20 58 28.91 | 11.550 | 16 21 29.3 | 36.32 | 21 20.0 | 17 | 23 18 37.98 | 11.041 | 5 42 43.7 | 63.07 | 21 37.8 | | | | |
| 18 | 21 3 5.97 | 11.539 | 16 6 43.5 | 37.49 | 21 20.7 | 18 | 23 23 2.83 | 11.029 | 5 17 24.3 | 63.54 | 21 38.2 | | | | |
| 19 | 21 7 42.77 | 11.528 | 15 51 29.8 | 38.64 | 21 21.3 | 19 | 23 27 27.40 | 11.018 | 4 51 53.8 | 63.99 | 21 38.7 | | | | |
| 20 | 21 12 19.28 | 11.515 | 15 35 48.7 | 39.78 | 21 22.0 | 20 | 23 31 51.73 | 11.009 | 4 26 12.9 | 64.41 | 21 39.1 | | | | |
| 21 | 21 16 55.48 | +11.502 | -15 19 40.5 | +40.90 | 21 22.6 | 21 | 23 36 15.84 | +11.001 | -4 0 22.2 | +64.81 | 21 39.6 | | | | |
| 22 | 21 21 31.35 | 11.487 | 15 3 5.6 | 42.00 | 21 23.3 | 22 | 23 40 39.78 | 10.984 | 3 34 22.2 | 65.18 | 21 40.0 | | | | |
| 23 | 21 26 6.87 | 11.472 | 14 46 4.5 | 43.09 | 21 23.9 | 23 | 23 45 3.54 | 10.968 | 3 8 13.6 | 65.53 | 21 40.5 | | | | |
| 24 | 21 30 42.02 | 11.456 | 14 28 37.4 | 44.16 | 21 24.6 | 24 | 23 49 27.17 | 10.953 | 2 41 57.1 | 65.85 | 21 41.0 | | | | |
| 25 | 21 35 16.79 | 11.440 | 14 10 44.9 | 45.21 | 21 25.2 | 25 | 23 53 50.69 | 10.939 | 2 15 33.1 | 66.14 | 21 41.5 | | | | |
| 26 | 21 39 51.16 | +11.424 | -13 52 27.5 | +46.24 | 21 25.9 | 26 | 23 58 14.13 | +10.926 | -1 49 2.4 | +66.41 | 21 42.0 | | | | |
| 27 | 21 44 25.14 | 11.407 | 13 33 45.6 | 47.25 | 21 26.5 | 27 | 0 2 37.53 | 10.914 | 1 22 25.5 | 66.65 | 21 42.5 | | | | |
| 28 | 21 48 58.71 | 11.390 | 13 14 39.6 | 48.24 | 21 27.1 | 28 | 0 7 0.91 | 10.904 | 0 55 43.1 | 66.87 | 21 42.9 | | | | |
| 29 | 21 53 31.86 | 11.372 | 12 55 10.0 | 49.21 | 21 27.7 | 29 | 0 11 24.30 | 10.905 | 0 28 55.8 | 67.06 | 21 43.3 | | | | |
| 30 | 21 58 4.57 | 11.354 | 12 35 17.4 | 50.16 | 21 28.3 | 30 | 0 15 47.74 | 10.977 | -0 2 4.4 | 67.22 | 21 43.7 | | | | |
| 31 | 22 2 36.83 | +11.335 | -12 15 2.3 | +51.09 | 21 28.9 | 31 | 0 20 11.24 | +10.980 | +0 24 50.5 | +67.35 | 21 44.1 | | | | |
| 32 | 22 7 8.64 | +11.316 | -11 54 25.2 | +52.00 | 21 29.5 | 32 | 0 24 34.83 | +10.985 | +0 51 48.2 | +67.46 | 21 44.6 | | | | |
| | | | | | | | | | | | | | | | |
| Day of the Month. | | 2d. | 7th. | 12th. | 17th. | 22d. | 27th. | Day of the Month. | | 1st. | 6th. | 11th. | 16th. | 21st. | 26th. |
| Semidiameter . . | | 10.6 | 10.1 | 9.7 | 9.3 | 8.9 | 8.6 | Semidiameter . . | | 8.3 | 8.0 | 7.8 | 7.5 | 7.3 | 7.1 |
| Hor. Parallax . . | | 11.0 | 10.5 | 10.0 | 9.6 | 9.3 | 8.9 | Hor. Parallax . . | | 8.6 | 8.3 | 8.0 | 7.8 | 7.6 | 7.4 |

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

| MAY. | | | | | | JUNE. | | | | | |
|-------------------|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|-------------------|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ' " | " | | | h m | h m s | s | ° ' " | |
| 1 | 0 20 11.24 | +10.980 | + 0 24 50.5 | +57.35 | 21 44.1 | 1 | 2 39 38.06 | +11.716 | +13 47 20.7 | +57.58 | 22 1.6 |
| 2 | 0 24 34.83 | 10.985 | 0 51 48.2 | 57.46 | 21 44.6 | 2 | 2 44 19.72 | 11.757 | 14 10 13.4 | 56.80 | 22 2.4 |
| 3 | 0 28 58.55 | 10.991 | 1 18 48.2 | 57.54 | 21 45.1 | 3 | 2 49 2.39 | 11.800 | 14 32 47.2 | 56.00 | 22 3.2 |
| 4 | 0 33 22.42 | 10.998 | 1 45 49.8 | 57.59 | 21 45.5 | 4 | 2 53 46.10 | 11.843 | 14 55 1.4 | 55.17 | 22 4.0 |
| 5 | 0 37 46.48 | 11.007 | 2 12 52.2 | 57.61 | 21 46.0 | 5 | 2 58 30.85 | 11.887 | 15 16 55.3 | 54.31 | 22 4.8 |
| 6 | 0 42 10.75 | +11.016 | + 2 39 54.8 | +57.60 | 21 46.5 | 6 | 3 3 16.66 | +11.931 | +15 38 28.2 | +53.49 | 22 5.6 |
| 7 | 0 46 35.26 | 11.026 | 3 6 56.9 | 57.56 | 21 47.0 | 7 | 3 8 3.53 | 11.975 | 15 59 39.2 | 52.50 | 22 6.5 |
| 8 | 0 51 0.04 | 11.038 | 3 33 57.8 | 57.50 | 21 47.4 | 8 | 3 12 51.48 | 12.020 | 16 20 27.8 | 51.54 | 22 7.4 |
| 9 | 0 55 25.12 | 11.052 | 4 0 56.9 | 57.49 | 21 47.9 | 9 | 3 17 40.51 | 12.066 | 16 40 53.1 | 50.56 | 22 8.3 |
| 10 | 0 59 50.53 | 11.066 | 4 27 53.5 | 57.30 | 21 48.4 | 10 | 3 22 30.64 | 12.112 | 17 0 54.6 | 49.55 | 22 9.2 |
| 11 | 1 4 16.31 | +11.082 | + 4 54 46.9 | +57.15 | 21 48.9 | 11 | 3 27 21.87 | +12.158 | +17 20 31.6 | +48.52 | 22 10.1 |
| 12 | 1 8 42.48 | 11.099 | 5 21 36.4 | 56.97 | 21 49.4 | 12 | 3 32 14.21 | 12.204 | 17 39 43.3 | 47.45 | 22 11.0 |
| 13 | 1 13 9.08 | 11.118 | 5 48 21.3 | 56.76 | 21 49.9 | 13 | 3 37 7.65 | 12.250 | 17 58 29.2 | 46.36 | 22 12.0 |
| 14 | 1 17 36.14 | 11.138 | 6 15 0.9 | 56.53 | 21 50.4 | 14 | 3 42 2.19 | 12.296 | 18 16 48.4 | 45.23 | 22 13.0 |
| 15 | 1 22 3.69 | 11.159 | 6 41 34.6 | 56.27 | 21 50.9 | 15 | 3 46 57.84 | 12.342 | 18 34 40.3 | 44.08 | 22 14.0 |
| 16 | 1 26 31.76 | +11.181 | + 7 8 1.8 | +55.99 | 21 51.4 | 16 | 3 51 54.59 | +12.388 | +18 52 4.3 | +42.91 | 22 15.0 |
| 17 | 1 31 0.39 | 11.225 | 7 34 21.8 | 55.69 | 21 51.9 | 17 | 3 56 52.45 | 12.434 | 19 8 59.8 | 41.71 | 22 16.1 |
| 18 | 1 35 29.60 | 11.230 | 8 0 34.1 | 55.34 | 21 52.5 | 18 | 4 1 51.40 | 12.479 | 19 25 26.1 | 40.48 | 22 17.1 |
| 19 | 1 39 59.43 | 11.257 | 8 26 37.7 | 54.96 | 21 53.0 | 19 | 4 6 51.43 | 12.524 | 19 41 22.5 | 39.22 | 22 18.2 |
| 20 | 1 44 29.92 | 11.285 | 8 52 32.0 | 54.56 | 21 53.6 | 20 | 4 11 52.56 | 12.569 | 19 56 48.5 | 37.94 | 22 19.3 |
| 21 | 1 49 1.10 | +11.314 | + 9 18 16.6 | +54.13 | 21 54.2 | 21 | 4 16 54.76 | +12.614 | +20 11 43.5 | +36.64 | 22 20.4 |
| 22 | 1 53 33.01 | 11.345 | 9 43 50.5 | 53.68 | 21 54.6 | 22 | 4 21 58.02 | 12.658 | 20 26 6.8 | 35.31 | 22 21.5 |
| 23 | 1 58 5.67 | 11.377 | 10 9 13.3 | 53.21 | 21 55.4 | 23 | 4 27 2.32 | 12.701 | 20 39 57.8 | 33.95 | 22 22.7 |
| 24 | 2 2 39.10 | 11.410 | 10 34 24.2 | 52.70 | 21 56.0 | 24 | 4 32 7.64 | 12.743 | 20 53 16.1 | 32.57 | 22 23.8 |
| 25 | 2 7 13.35 | 11.445 | 10 59 22.5 | 52.16 | 21 56.6 | 25 | 4 37 13.95 | 12.784 | 21 6 1.1 | 31.17 | 22 25.0 |
| 26 | 2 11 48.44 | +11.480 | +11 24 7.6 | +51.59 | 21 57.3 | 26 | 4 42 21.24 | +12.824 | +21 18 12.1 | +29.75 | 22 26.2 |
| 27 | 2 16 24.40 | 11.517 | 11 48 38.8 | 50.99 | 21 58.0 | 27 | 4 47 29.48 | 12.863 | 21 29 48.7 | 28.30 | 22 27.4 |
| 28 | 2 21 1.25 | 11.554 | 12 12 55.2 | 50.37 | 21 58.7 | 28 | 4 52 38.66 | 12.901 | 21 40 50.2 | 26.83 | 22 28.6 |
| 29 | 2 25 39.02 | 11.593 | 12 36 56.3 | 49.72 | 21 59.4 | 29 | 4 57 48.73 | 12.937 | 21 51 16.2 | 25.34 | 22 29.8 |
| 30 | 2 30 17.73 | 11.633 | 13 0 41.4 | 49.04 | 22 0.1 | 30 | 5 2 59.66 | 12.972 | 22 1 6.2 | 23.83 | 22 31.0 |
| 31 | 2 34 57.41 | +11.674 | +13 24 9.8 | +58.32 | 22 0.8 | 31 | 5 8 11.41 | +13.006 | +22 10 19.8 | +22.30 | 22 32.3 |
| 32 | 2 39 38.06 | +11.715 | +13 47 20.7 | +57.58 | 22 1.6 | 32 | 5 13 23.94 | +13.038 | +22 18 56.4 | +20.75 | 22 33.6 |
| Day of the Month. | | | | | | Day of the Month. | | | | | |
| 1st. | | | | | | 5th. | | | | | |
| 6th. | | | | | | 10th. | | | | | |
| 11th. | | | | | | 15th. | | | | | |
| 16th. | | | | | | 20th. | | | | | |
| 21st. | | | | | | 25th. | | | | | |
| 26th. | | | | | | 30th. | | | | | |
| 31st. | | | | | | | | | | | |
| Semidiameter . . | | | | | | Semidiameter . . | | | | | |
| Hor. Parallax . . | | | | | | Hor. Parallax . . | | | | | |

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

| JULY. | | | | | | AUGUST. | | | | | |
|---------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|---------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m |
| 1 | 5 8 11.41 | +13.006 | +22 10 19.8 | +22.30 | 22 32.3 | 1 | 7 51 42.92 | +13.035 | +21 31 11.6 | -28.78 | 23 13.7 |
| 2 | 5 13 23.94 | 13.038 | 22 18 56.4 | 20.75 | 22 33.6 | 2 | 7 56 55.40 | 13.004 | 21 19 22.2 | 30.34 | 23 14.9 |
| 3 | 5 18 37.21 | 13.068 | 22 26 55.6 | 19.18 | 22 34.9 | 3 | 8 2 7.12 | 12.972 | 21 6 55.5 | 31.88 | 23 16.2 |
| 4 | 5 23 51.18 | 13.096 | 22 34 17.0 | 17.60 | 22 36.2 | 4 | 8 7 18.04 | 12.938 | 20 53 52.0 | 33.41 | 23 17.4 |
| 5 | 5 29 5.80 | 13.122 | 22 41 0.2 | 16.00 | 22 37.5 | 5 | 8 12 28.13 | 12.903 | 20 40 12.0 | 34.92 | 23 18.6 |
| 6 | 5 34 21.03 | +13.146 | +22 47 5.0 | +14.30 | 22 38.8 | 6 | 8 17 37.37 | +12.867 | +20 25 56.0 | -36.41 | 23 19.8 |
| 7 | 5 39 36.82 | 13.168 | 22 52 30.9 | 12.77 | 22 40.2 | 7 | 8 22 45.72 | 12.830 | 20 11 4.6 | 37.88 | 23 21.0 |
| 8 | 5 44 53.12 | 13.189 | 22 57 17.7 | 11.13 | 22 41.5 | 8 | 8 27 53.17 | 12.791 | 19 55 38.3 | 39.32 | 23 22.2 |
| 9 | 5 50 9.88 | 13.207 | 23 1 25.1 | 9.48 | 22 42.9 | 9 | 8 32 59.68 | 12.751 | 19 39 37.6 | 40.74 | 23 23.4 |
| 10 | 5 55 27.04 | 13.223 | 23 4 52.8 | 7.89 | 22 44.2 | 10 | 8 38 5.22 | 12.711 | 19 23 3.0 | 42.14 | 23 24.5 |
| 11 | 6 0 44.56 | +13.237 | +23 7 40.4 | +6.14 | 22 45.6 | 11 | 8 43 9.79 | +12.670 | +19 5 55.1 | -43.52 | 23 25.6 |
| 12 | 6 6 2.38 | 13.248 | 23 9 48.0 | 4.48 | 22 46.9 | 12 | 8 48 13.37 | 12.638 | 18 48 14.4 | 44.87 | 23 26.7 |
| 13 | 6 11 20.45 | 13.257 | 23 11 15.4 | 2.80 | 22 48.3 | 13 | 8 53 15.94 | 12.598 | 18 30 1.6 | 46.19 | 23 27.8 |
| 14 | 6 16 38.72 | 13.264 | 23 12 2.4 | +1.11 | 22 49.7 | 14 | 8 58 17.50 | 12.543 | 18 11 17.3 | 47.49 | 23 28.8 |
| 15 | 6 21 57.13 | 13.269 | 23 12 8.8 | -0.58 | 22 51.1 | 15 | 9 3 18.02 | 12.501 | 17 52 2.1 | 48.77 | 23 29.9 |
| 16 | 6 27 15.63 | +13.272 | +23 11 34.6 | -2.27 | 22 52.5 | 16 | 9 8 17.52 | +12.458 | +17 32 16.6 | -50.09 | 23 30.9 |
| 17 | 6 32 34.18 | 13.273 | 23 10 19.7 | 3.97 | 22 53.8 | 17 | 9 13 15.98 | 12.415 | 17 12 1.4 | 51.24 | 23 31.9 |
| 18 | 6 37 52.71 | 13.271 | 23 8 24.2 | 5.66 | 22 55.2 | 18 | 9 18 13.41 | 12.379 | 16 51 17.2 | 52.44 | 23 32.9 |
| 19 | 6 43 11.19 | 13.267 | 23 5 48.2 | 7.35 | 22 56.5 | 19 | 9 23 9.82 | 12.329 | 16 30 4.6 | 53.61 | 23 33.9 |
| 20 | 6 48 29.54 | 13.261 | 23 2 31.4 | 9.04 | 22 57.9 | 20 | 9 28 5.20 | 12.286 | 16 8 24.3 | 54.75 | 23 34.9 |
| 21 | 6 53 47.72 | +13.253 | +22 58 34.1 | -10.73 | 22 59.2 | 21 | 9 32 59.56 | +12.244 | +15 46 17.0 | -55.86 | 23 35.8 |
| 22 | 6 59 5.69 | 13.243 | 22 53 56.3 | 12.41 | 23 0.6 | 22 | 9 37 52.91 | 12.202 | 15 23 43.1 | 56.95 | 23 36.8 |
| 23 | 7 4 23.39 | 13.231 | 22 48 38.2 | 14.09 | 23 1.9 | 23 | 9 42 45.26 | 12.160 | 15 0 43.6 | 58.01 | 23 37.7 |
| 24 | 7 9 40.78 | 13.217 | 22 42 39.9 | 15.76 | 23 3.3 | 24 | 9 47 36.61 | 12.119 | 14 37 19.0 | 59.04 | 23 38.6 |
| 25 | 7 14 57.81 | 13.201 | 22 36 1.6 | 17.43 | 23 4.6 | 25 | 9 52 26.99 | 12.079 | 14 13 30.1 | 60.04 | 23 39.5 |
| 26 | 7 20 14.42 | +13.183 | +22 28 43.4 | -19.06 | 23 5.9 | 26 | 9 57 16.41 | +12.039 | +13 49 17.4 | -61.01 | 23 40.3 |
| 27 | 7 25 30.58 | 13.163 | 22 20 45.5 | 20.73 | 23 7.2 | 27 | 10 2 4.89 | 12.000 | 13 24 41.8 | 61.85 | 23 41.2 |
| 28 | 7 30 46.23 | 13.141 | 22 12 8.3 | 22.36 | 23 8.5 | 28 | 10 6 52.44 | 11.962 | 12 59 44.0 | 62.86 | 23 42.0 |
| 29 | 7 36 1.34 | 13.117 | 22 2 52.0 | 23.99 | 23 9.8 | 29 | 10 11 39.08 | 11.925 | 12 34 24.5 | 63.74 | 23 42.8 |
| 30 | 7 41 15.85 | 13.091 | 21 52 56.9 | 25.60 | 23 11.1 | 30 | 10 16 24.82 | 11.888 | 12 8 44.1 | 64.60 | 23 43.6 |
| 31 | 7 46 29.72 | +13.064 | +21 42 23.3 | -27.20 | 23 12.4 | 31 | 10 21 9.68 | +11.852 | +11 42 43.6 | -65.42 | 23 44.4 |
| 32 | 7 51 42.92 | +13.035 | +21 31 11.6 | -28.78 | 23 13.7 | 32 | 10 25 53.70 | +11.817 | +11 16 23.6 | -66.22 | 23 45.2 |

| Day of the Month. | 5th. | 10th. | 15th. | 20th. | 25th. | 30th. | Day of the Month. | 4th. | 9th. | 14th. | 19th. | 24th. | 29th. |
|-------------------|------|-------|-------|-------|-------|-------|-------------------|------|------|-------|-------|-------|-------|
| Semidiameter | 5.4 | 5.3 | 5.3 | 5.2 | 5.2 | 5.1 | Semidiameter | 5.1 | 5.1 | 5.0 | 5.0 | 5.0 | 5.0 |
| Hor. Parallax | 5.6 | 5.5 | 5.5 | 5.4 | 5.4 | 5.3 | Hor. Parallax | 5.3 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 |

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

| SEPTEMBER. | | | | | | OCTOBER. | | | | | |
|-------------------|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|-------------------|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ' " | " | | | h m s | s | ° ' " | " | |
| 1 | 10 25 53.70 | +11.817 | +11 16 23.6 | -66.22 | 23 45.2 | 1 | 12 43 55.50 | +11.430 | - 3 23 23.3 | -75.85 | 0 4.2 |
| 2 | 10 30 36.90 | 11.783 | 10 49 45.0 | 66.99 | 23 46.0 | 2 | 12 48 29.97 | 11.443 | 3 53 41.8 | 75.70 | 0 4.9 |
| 3 | 10 35 19.29 | 11.750 | 10 22 48.4 | 67.72 | 23 46.7 | 3 | 12 53 4.78 | 11.458 | 4 23 56.2 | 75.51 | 0 5.5 |
| 4 | 10 40 0.91 | 11.719 | 9 55 34.7 | 68.49 | 23 47.5 | 4 | 12 57 39.96 | 11.475 | 4 54 5.8 | 75.29 | 0 6.1 |
| 5 | 10 44 41.78 | 11.688 | 9 28 4.4 | 69.09 | 23 48.2 | 5 | 13 2 15.55 | 11.493 | 5 24 9.8 | 75.04 | 0 6.8 |
| 6 | 10 49 21.92 | +11.658 | + 9 0 18.5 | -69.73 | 23 48.9 | 6 | 13 6 51.59 | +11.513 | - 5 54 7.4 | -74.76 | 0 7.4 |
| 7 | 10 54 1.38 | 11.630 | 8 32 17.6 | 70.34 | 23 49.6 | 7 | 13 11 28.14 | 11.534 | 6 23 57.8 | 74.44 | 0 8.1 |
| 8 | 10 58 40.17 | 11.603 | 8 4 2.4 | 70.92 | 23 50.3 | 8 | 13 16 5.21 | 11.557 | 6 53 40.2 | 74.09 | 0 8.8 |
| 9 | 11 3 18.33 | 11.577 | 7 35 33.7 | 71.47 | 23 51.0 | 9 | 13 20 42.85 | 11.581 | 7 23 13.9 | 73.71 | 0 9.5 |
| 10 | 11 7 55.89 | 11.553 | 7 6 52.2 | 71.99 | 23 51.7 | 10 | 13 25 21.10 | 11.607 | 7 52 38.0 | 73.30 | 0 10.2 |
| 11 | 11 12 32.88 | +11.530 | + 6 37 58.7 | -72.47 | 23 52.3 | 11 | 13 29 59.98 | +11.635 | - 8 21 51.8 | -72.85 | 0 10.9 |
| 12 | 11 17 9.35 | 11.509 | 6 8 53.9 | 72.99 | 23 53.0 | 12 | 13 34 39.56 | 11.665 | 8 50 54.6 | 72.37 | 0 11.6 |
| 13 | 11 21 45.34 | 11.489 | 5 39 38.5 | 73.35 | 23 53.6 | 13 | 13 39 19.88 | 11.696 | 9 19 45.5 | 71.86 | 0 12.3 |
| 14 | 11 26 20.87 | 11.471 | 5 10 13.2 | 73.74 | 23 54.3 | 14 | 13 44 0.96 | 11.729 | 9 48 23.7 | 71.32 | 0 13.1 |
| 15 | 11 30 55.99 | 11.455 | 4 40 38.7 | 74.11 | 23 54.9 | 15 | 13 48 42.82 | 11.763 | 10 16 48.4 | 70.74 | 0 13.9 |
| 16 | 11 35 30.73 | +11.441 | + 4 10 55.9 | -74.45 | 23 55.6 | 16 | 13 53 25.53 | +11.799 | -10 44 59.1 | -70.14 | 0 14.6 |
| 17 | 11 40 5.14 | 11.426 | 3 41 5.5 | 74.75 | 23 56.2 | 17 | 13 58 9.11 | 11.835 | 11 12 54.8 | 69.50 | 0 15.4 |
| 18 | 11 44 39.25 | 11.417 | 3 11 8.1 | 75.02 | 23 56.8 | 18 | 14 2 53.59 | 11.873 | 11 40 34.9 | 68.83 | 0 16.2 |
| 19 | 11 49 13.12 | 11.407 | 2 41 4.5 | 75.27 | 23 57.4 | 19 | 14 7 39.01 | 11.913 | 12 7 58.4 | 68.13 | 0 17.0 |
| 20 | 11 53 46.78 | 11.399 | 2 10 55.3 | 75.48 | 23 58.0 | 20 | 14 12 25.41 | 11.954 | 12 35 4.7 | 67.39 | 0 17.8 |
| 21 | 11 58 20.28 | +11.393 | + 1 40 41.3 | -75.68 | 23 58.6 | 21 | 14 17 12.82 | +11.997 | -13 1 52.8 | -66.63 | 0 18.6 |
| 22 | 12 2 53.66 | 11.388 | 1 10 23.2 | 75.83 | 23 59.2 | 22 | 14 22 1.26 | 12.040 | 13 28 22.1 | 65.89 | 0 19.5 |
| 23 | 12 7 26.95 | 11.386 | 0 40 1.7 | 75.96 | 23 59.9 | 23 | 14 26 50.76 | 12.085 | 13 54 31.7 | 64.98 | 0 20.4 |
| 24 | 12 12 0.20 | 11.386 | + 0 9 37.5 | 76.06 | | 24 | 14 31 41.36 | 12.131 | 14 20 20.9 | 64.11 | 0 21.3 |
| 25 | 12 16 33.46 | 11.387 | - 0 20 48.6 | 76.19 | 0 0.5 | 25 | 14 36 33.08 | 12.178 | 14 45 48.8 | 63.21 | 0 22.2 |
| 26 | 12 21 6.77 | +11.390 | - 0 51 15.8 | -76.15 | 0 1.1 | 26 | 14 41 25.93 | +12.226 | -15 10 54.7 | -62.27 | 0 23.2 |
| 27 | 12 25 40.18 | 11.394 | 1 21 43.4 | 76.15 | 0 1.7 | 27 | 14 46 19.94 | 12.275 | 15 35 37.7 | 61.30 | 0 24.1 |
| 28 | 12 30 13.71 | 11.400 | 1 52 10.7 | 76.19 | 0 2.4 | 28 | 14 51 15.13 | 12.325 | 15 59 57.0 | 60.30 | 0 25.1 |
| 29 | 12 34 47.41 | 11.408 | 2 22 37.0 | 76.06 | 0 3.0 | 29 | 14 56 11.52 | 12.375 | 16 23 51.9 | 59.26 | 0 26.1 |
| 30 | 12 39 21.33 | 11.418 | 2 53 1.4 | 75.97 | 0 3.6 | 30 | 15 1 9.12 | 12.426 | 16 47 21.5 | 58.19 | 0 27.1 |
| 31 | 12 43 55.50 | +11.430 | - 3 23 23.3 | -75.85 | 0 4.2 | 31 | 15 6 7.94 | +12.477 | -17 10 25.0 | -57.09 | 0 28.2 |
| 32 | 12 48 29.97 | +11.443 | - 3 53 41.8 | -75.70 | 0 4.9 | 32 | 15 11 7.99 | +12.528 | -17 33 1.6 | -55.95 | 0 29.2 |
| Day of the Month. | | | | | | Day of the Month. | | | | | |
| | | | | | | | | | | | |
| Semidiameter . . | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | Semidiameter . . | 5.0 | 5.0 | 5.0 | 5.0 | 5.1 |
| Hor. Parallax . . | 5.1 | 5.1 | 5.1 | 5.1 | 5.2 | Hor. Parallax . . | 5.2 | 5.2 | 5.2 | 5.2 | 5.3 |

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

| NOVEMBER. | | | | | | DECEMBER. | | | | | | | | | | |
|---------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|---------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|-------|-------|------|-------|------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | | | | | |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | | | | | | |
| | h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m | | | | | |
| 1 | 15 11 7.99 | +12.528 | -17 33 1.6 | -55.95 | 0 29.2 | 1 | 17 49 46.20 | +13.713 | -24 22 57.8 | - 8.72 | 1 9.6 | | | | | |
| 2 | 15 16 9.27 | 12.579 | 17 55 10.5 | 54.78 | 0 30.3 | 2 | 17 55 15.44 | 13.723 | 24 26 4.7 | 6.85 | 1 11.1 | | | | | |
| 3 | 15 21 11.80 | 12.631 | 18 16 50.8 | 53.59 | 0 31.4 | 3 | 18 0 44.90 | 13.730 | 24 28 26.5 | 4.97 | 1 12.7 | | | | | |
| 4 | 15 26 15.57 | 12.683 | 18 38 1.8 | 52.34 | 0 32.5 | 4 | 18 6 14.50 | 13.735 | 24 30 3.2 | 3.08 | 1 14.2 | | | | | |
| 5 | 15 31 20.58 | 12.735 | 18 58 42.7 | 51.07 | 0 33.7 | 5 | 18 11 44.17 | 13.736 | 24 30 54.6 | - 1.20 | 1 15.8 | | | | | |
| 6 | 15 36 26.83 | +12.786 | -19 18 52.8 | -49.77 | 0 34.8 | 6 | 18 17 13.85 | +13.735 | -24 31 0.7 | + 0.69 | 1 17.3 | | | | | |
| 7 | 15 41 34.31 | 12.837 | 19 38 31.2 | 48.44 | 0 36.0 | 7 | 18 22 43.45 | 13.731 | 24 30 21.6 | 9.58 | 1 18.9 | | | | | |
| 8 | 15 46 43.01 | 12.888 | 19 57 37.2 | 47.07 | 0 37.2 | 8 | 18 28 12.92 | 13.724 | 24 28 57.0 | 4.46 | 1 20.4 | | | | | |
| 9 | 15 51 52.92 | 12.938 | 20 16 10.1 | 45.67 | 0 38.4 | 9 | 18 33 42.17 | 13.714 | 24 26 47.1 | 6.34 | 1 22.0 | | | | | |
| 10 | 15 57 4.04 | 12.988 | 20 34 9.2 | 44.25 | 0 39.6 | 10 | 18 39 11.14 | 13.701 | 24 23 52.2 | 8.22 | 1 23.5 | | | | | |
| 11 | 16 2 16.34 | +13.037 | -20 51 33.7 | -42.79 | 0 40.9 | 11 | 18 44 39.77 | +13.685 | -24 20 12.4 | +10.10 | 1 25.1 | | | | | |
| 12 | 16 7 29.82 | 13.085 | 21 8 22.8 | 41.31 | 0 42.2 | 12 | 18 50 7.99 | 13.667 | 24 15 47.6 | 11.97 | 1 26.6 | | | | | |
| 13 | 16 12 44.44 | 13.132 | 21 24 35.9 | 39.79 | 0 43.5 | 13 | 18 55 35.74 | 13.646 | 24 10 38.1 | 13.83 | 1 28.2 | | | | | |
| 14 | 16 18 0.18 | 13.179 | 21 40 12.4 | 38.25 | 0 44.8 | 14 | 19 1 2.94 | 13.623 | 24 4 44.2 | 15.67 | 1 29.7 | | | | | |
| 15 | 16 23 17.03 | 13.225 | 21 55 11.6 | 36.68 | 0 46.2 | 15 | 19 6 29.55 | 13.597 | 23 58 6.1 | 17.51 | 1 31.2 | | | | | |
| 16 | 16 28 34.95 | +13.269 | -22 9 32.9 | -35.09 | 0 47.5 | 16 | 19 11 55.52 | +13.568 | -23 50 44.1 | +19.33 | 1 32.7 | | | | | |
| 17 | 16 33 53.92 | 13.319 | 22 23 15.6 | 33.47 | 0 48.9 | 17 | 19 17 20.77 | 13.537 | 23 42 38.5 | 21.14 | 1 34.1 | | | | | |
| 18 | 16 39 13.91 | 13.363 | 22 36 19.3 | 31.83 | 0 50.3 | 18 | 19 22 45.25 | 13.504 | 23 33 49.6 | 22.93 | 1 35.6 | | | | | |
| 19 | 16 44 34.87 | 13.393 | 22 48 43.3 | 30.17 | 0 51.7 | 19 | 19 28 8.91 | 13.469 | 23 24 17.8 | 24.71 | 1 37.0 | | | | | |
| 20 | 16 49 56.77 | 13.422 | 23 0 27.1 | 28.48 | 0 53.1 | 20 | 19 33 31.72 | 13.432 | 23 14 3.5 | 26.47 | 1 38.5 | | | | | |
| 21 | 16 55 19.57 | +13.469 | -23 11 30.0 | -26.76 | 0 54.6 | 21 | 19 38 53.60 | +13.392 | -23 3 7.2 | +28.21 | 1 39.9 | | | | | |
| 22 | 17 0 43.23 | 13.504 | 23 21 51.6 | 25.03 | 0 56.0 | 22 | 19 44 14.51 | 13.351 | 22 51 29.4 | 29.93 | 1 41.3 | | | | | |
| 23 | 17 6 7.70 | 13.537 | 23 31 31.5 | 23.28 | 0 57.5 | 23 | 19 49 34.41 | 13.308 | 22 39 10.6 | 31.63 | 1 42.7 | | | | | |
| 24 | 17 11 32.94 | 13.567 | 23 40 29.1 | 21.51 | 0 59.0 | 24 | 19 54 53.25 | 13.263 | 22 26 11.2 | 33.31 | 1 44.1 | | | | | |
| 25 | 17 16 58.88 | 13.595 | 23 48 44.1 | 19.73 | 1 0.5 | 25 | 20 0 11.01 | 13.217 | 22 12 31.7 | 34.97 | 1 45.4 | | | | | |
| 26 | 17 22 25.47 | +13.621 | -23 56 16.0 | -17.93 | 1 2.0 | 26 | 20 5 27.65 | +13.169 | -21 58 12.8 | +36.60 | 1 46.8 | | | | | |
| 27 | 17 27 52.67 | 13.645 | 24 3 4.5 | 16.11 | 1 3.5 | 27 | 20 10 43.12 | 13.120 | 21 43 15.0 | 38.21 | 1 48.1 | | | | | |
| 28 | 17 33 20.40 | 13.666 | 24 9 9.3 | 14.28 | 1 5.0 | 28 | 20 15 57.38 | 13.069 | 21 27 38.9 | 39.79 | 1 49.4 | | | | | |
| 29 | 17 38 48.61 | 13.684 | 24 14 29.9 | 12.43 | 1 6.5 | 29 | 20 21 10.41 | 13.017 | 21 11 25.1 | 41.35 | 1 50.7 | | | | | |
| 30 | 17 44 17.23 | 13.700 | 24 19 6.2 | 10.58 | 1 8.0 | 30 | 20 26 22.19 | 12.964 | 20 54 34.3 | 42.88 | 1 51.9 | | | | | |
| 31 | 17 49 46.20 | +13.713 | -24 22 57.8 | - 8.72 | 1 9.6 | 31 | 20 31 32.69 | +12.910 | -20 37 7.1 | +44.38 | 1 53.1 | | | | | |
| 32 | 17 55 15.44 | +13.723 | -24 26 4.7 | - 6.85 | 1 11.1 | 32 | 20 36 41.88 | +12.855 | -20 19 4.4 | +45.85 | 1 54.3 | | | | | |
| | | | | | | | | | | | | | | | | |
| Day of the Month. | | 2d. | 7th. | 12th. | 17th. | 22d. | 27th. | Day of the Month. | | 2d. | 7th. | 12th. | 17th. | 22d. | 27th. | 32d. |
| Semidiameter . . . | | 5.1 | 5.2 | 5.2 | 5.2 | 5.3 | 5.3 | Semidiameter . . | | 5.4 | 5.4 | 5.5 | 5.6 | 5.6 | 5.7 | 5.8 |
| Hor. Parallax . . . | | 5.3 | 5.3 | 5.4 | 5.4 | 5.5 | 5.5 | Hor. Parallax . . | | 5.6 | 5.6 | 5.7 | 5.8 | 5.8 | 5.9 | 6.0 |

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

| JANUARY. | | | | | | FEBRUARY. | | | | | | | |
|-------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|---------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|-------|-------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | | |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | | | |
| | h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m | | |
| 1 | 22 53 13.94 | +6.910 | -7 58 54.1 | +45.93 | 4 9.6 | 1 | 0 17 23.86 | +6.707 | +1 33 48.1 | +45.99 | 3 31.6 | | |
| 2 | 22 55 59.65 | 6.900 | 7 40 46.9 | 45.96 | 4 8.5 | 2 | 0 20 4.81 | 6.706 | 1 52 11.0 | 45.91 | 3 30.4 | | |
| 3 | 22 58 45.12 | 6.889 | 7 22 36.6 | 45.48 | 4 7.3 | 3 | 0 22 45.73 | 6.705 | 2 10 31.9 | 45.82 | 3 29.1 | | |
| 4 | 23 1 30.33 | 6.879 | 7 4 23.5 | 45.60 | 4 6.1 | 4 | 0 25 26.63 | 6.704 | 2 28 50.6 | 45.72 | 3 27.9 | | |
| 5 | 23 4 15.31 | 6.870 | 6 46 7.6 | 45.71 | 4 4.9 | 5 | 0 28 7.50 | 6.704 | 2 47 7.0 | 45.62 | 3 26.6 | | |
| 6 | 23 7 0.07 | +6.861 | -6 27 49.1 | +45.82 | 4 3.7 | 6 | 0 30 48.36 | +6.703 | +3 5 20.9 | +45.52 | 3 25.3 | | |
| 7 | 23 9 44.61 | 6.852 | 6 9 28.2 | 45.92 | 4 2.5 | 7 | 0 33 29.21 | 6.703 | 3 23 32.1 | 45.41 | 3 24.1 | | |
| 8 | 23 12 28.95 | 6.843 | 5 51 5.0 | 46.01 | 4 1.3 | 8 | 0 36 10.07 | 6.703 | 3 41 40.5 | 45.29 | 3 22.8 | | |
| 9 | 23 15 13.08 | 6.835 | 5 32 39.7 | 46.10 | 4 0.1 | 9 | 0 38 50.94 | 6.703 | 3 59 46.0 | 45.16 | 3 21.6 | | |
| 10 | 23 17 57.01 | 6.827 | 5 14 12.5 | 46.18 | 3 58.9 | 10 | 0 41 31.82 | 6.704 | 4 17 48.5 | 45.03 | 3 20.3 | | |
| 11 | 23 20 40.75 | +6.819 | -4 55 43.5 | +46.25 | 3 57.7 | 11 | 0 44 12.72 | +6.705 | +4 35 47.7 | +44.89 | 3 19.0 | | |
| 12 | 23 23 24.30 | 6.811 | 4 37 13.0 | 46.31 | 3 56.5 | 12 | 0 46 53.64 | 6.706 | 4 53 43.4 | 44.75 | 3 17.8 | | |
| 13 | 23 26 7.66 | 6.803 | 4 18 41.2 | 46.36 | 3 55.2 | 13 | 0 49 34.58 | 6.707 | 5 11 35.6 | 44.60 | 3 16.5 | | |
| 14 | 23 28 50.84 | 6.796 | 4 0 8.1 | 46.40 | 3 54.0 | 14 | 0 52 15.55 | 6.708 | 5 29 24.0 | 44.44 | 3 15.3 | | |
| 15 | 23 31 33.85 | 6.789 | 3 41 34.0 | 46.44 | 3 52.7 | 15 | 0 54 56.56 | 6.710 | 5 47 8.5 | 44.27 | 3 14.0 | | |
| 16 | 23 34 16.69 | +6.782 | -3 22 59.2 | +46.47 | 3 51.5 | 16 | 0 57 37.61 | +6.712 | +6 4 49.0 | +44.09 | 3 12.7 | | |
| 17 | 23 36 59.37 | 6.775 | 3 4 23.7 | 46.49 | 3 50.3 | 17 | 1 0 18.70 | 6.714 | 6 22 25.3 | 43.91 | 3 11.5 | | |
| 18 | 23 39 41.88 | 6.768 | 2 45 47.7 | 46.50 | 3 49.1 | 18 | 1 2 59.85 | 6.716 | 6 39 57.3 | 43.73 | 3 10.2 | | |
| 19 | 23 42 24.24 | 6.762 | 2 27 11.4 | 46.50 | 3 47.9 | 19 | 1 5 41.06 | 6.718 | 6 57 24.7 | 43.54 | 3 9.0 | | |
| 20 | 23 45 6.45 | 6.756 | 2 8 35.0 | 46.50 | 3 46.6 | 20 | 1 8 22.33 | 6.721 | 7 14 47.5 | 43.35 | 3 7.7 | | |
| 21 | 23 47 48.51 | +6.750 | -1 49 58.8 | +46.50 | 3 45.4 | 21 | 1 11 3.66 | +6.724 | +7 32 5.5 | +43.15 | 3 6.4 | | |
| 22 | 23 50 30.43 | 6.744 | 1 31 22.8 | 46.49 | 3 44.1 | 22 | 1 13 45.06 | 6.727 | 7 49 18.5 | 42.94 | 3 5.2 | | |
| 23 | 23 53 12.23 | 6.739 | 1 12 47.2 | 46.47 | 3 42.9 | 23 | 1 16 26.55 | 6.730 | 8 6 26.5 | 42.72 | 3 3.9 | | |
| 24 | 23 55 53.90 | 6.734 | 0 54 12.2 | 46.44 | 3 41.6 | 24 | 1 19 8.12 | 6.734 | 8 23 29.3 | 42.50 | 3 2.7 | | |
| 25 | 23 58 35.46 | 6.729 | 0 35 38.0 | 46.41 | 3 40.4 | 25 | 1 21 49.79 | 6.738 | 8 40 26.8 | 42.28 | 3 1.4 | | |
| 26 | 0 1 16.90 | +6.725 | -0 17 4.7 | +46.37 | 3 39.1 | 26 | 1 24 31.57 | +6.743 | +8 57 18.9 | +42.05 | 3 0.2 | | |
| 27 | 0 3 58.24 | 6.721 | +0 1 27.5 | 46.33 | 3 37.9 | 27 | 1 27 13.46 | 6.748 | 9 14 5.4 | 41.81 | 2 58.9 | | |
| 28 | 0 6 39.51 | 6.718 | 0 19 58.6 | 46.28 | 3 36.6 | 28 | 1 29 55.47 | 6.753 | 9 30 46.2 | 41.57 | 2 57.7 | | |
| 29 | 0 9 20.69 | 6.715 | 0 38 28.4 | 46.22 | 3 35.4 | 29 | 1 32 37.60 | 6.759 | 9 47 21.3 | 41.33 | 2 56.4 | | |
| 30 | 0 12 1.80 | 6.712 | 0 56 56.6 | 46.15 | 3 34.1 | 30 | 1 35 19.86 | 6.765 | 10 3 50.4 | 41.09 | 2 55.2 | | |
| 31 | 0 14 42.85 | +6.709 | +1 15 23.3 | +46.07 | 3 32.9 | 31 | 1 38 2.27 | +6.770 | +10 20 13.5 | +40.84 | 2 53.9 | | |
| 32 | 0 17 23.86 | +6.707 | +1 33 48.1 | +45.99 | 3 31.6 | 32 | 1 40 44.82 | +6.776 | +10 36 30.4 | +40.58 | 2 52.7 | | |
| | | | | | | | | | | | | | |
| Day of the Month. | 1st. | 6th. | 11th. | 16th. | 21st. | 26th. | 31st. | Day of the Month. | 5th. | 10th. | 15th. | 20th. | 25th. |
| Semidiameter . . | 3.1 | 3.1 | 3.0 | 3.0 | 2.9 | 2.9 | 2.8 | Semidiameter | 2.8 | 2.7 | 2.7 | 2.6 | 2.6 |
| Hor. Parallax . . | 5.5 | 5.4 | 5.3 | 5.2 | 5.1 | 5.0 | 4.9 | Hor. Parallax | 4.8 | 4.7 | 4.6 | 4.5 | 4.4 |

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

| MARCH. | | | | | | APRIL. | | | | | |
|---------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|---------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m |
| 1 | 1 32 37.60 | +6.759 | + 9 47 21.3 | +41.33 | 2 56.4 | 1 | 2 57 48.74 | +6.999 | +17 22 16.9 | +31.34 | 2 19.5 |
| 2 | 1 35 19.86 | 6.765 | 10 3 50.4 | 41.09 | 2 55.2 | 2 | 3 0 36.82 | 7.008 | 17 34 42.0 | 30.84 | 2 18.3 |
| 3 | 1 38 2.27 | 6.770 | 10 20 13.5 | 40.84 | 2 53.9 | 3 | 3 3 25.13 | 7.017 | 17 46 57.5 | 30.44 | 2 17.2 |
| 4 | 1 40 44.82 | 6.776 | 10 36 30.4 | 40.58 | 2 52.7 | 4 | 3 6 13.67 | 7.027 | 17 59 3.2 | 30.03 | 2 16.0 |
| 5 | 1 43 27.51 | 6.782 | 10 52 41.1 | 40.32 | 2 51.5 | 5 | 3 9 2.43 | 7.036 | 18 10 59.2 | 29.63 | 2 14.9 |
| 6 | 1 46 10.37 | +6.789 | +11 8 45.3 | +40.05 | 2 50.3 | 6 | 3 11 51.42 | +7.046 | +18 22 45.3 | +29.31 | 2 13.8 |
| 7 | 1 48 53.39 | 6.796 | 11 24 43.1 | 39.77 | 2 49.1 | 7 | 3 14 40.63 | 7.055 | 18 34 21.4 | 28.80 | 2 12.6 |
| 8 | 1 51 36.57 | 6.803 | 11 40 34.3 | 39.49 | 2 47.8 | 8 | 3 17 30.07 | 7.064 | 18 45 47.5 | 28.38 | 2 11.5 |
| 9 | 1 54 19.92 | 6.810 | 11 56 18.6 | 39.20 | 2 46.6 | 9 | 3 20 19.73 | 7.074 | 18 57 3.3 | 27.95 | 2 10.4 |
| 10 | 1 57 3.44 | 6.817 | 12 11 56.0 | 38.91 | 2 45.4 | 10 | 3 23 9.60 | 7.083 | 19 8 8.9 | 27.52 | 2 9.3 |
| 11 | 1 59 47.14 | +6.824 | +12 27 26.4 | +38.62 | 2 44.2 | 11 | 3 25 59.69 | +7.092 | +19 19 4.1 | +27.09 | 2 8.2 |
| 12 | 2 2 31.02 | 6.831 | 12 42 49.6 | 38.32 | 2 43.0 | 12 | 3 28 49.98 | 7.101 | 19 29 48.8 | 26.65 | 2 7.1 |
| 13 | 2 5 15.07 | 6.839 | 12 58 5.6 | 38.01 | 2 41.8 | 13 | 3 31 40.48 | 7.109 | 19 40 23.0 | 26.21 | 2 6.0 |
| 14 | 2 7 59.30 | 6.847 | 13 13 14.1 | 37.70 | 2 40.6 | 14 | 3 34 31.19 | 7.117 | 19 50 46.5 | 25.76 | 2 4.9 |
| 15 | 2 10 43.72 | 6.854 | 13 28 15.1 | 37.38 | 2 39.4 | 15 | 3 37 22.09 | 7.125 | 20 0 59.2 | 25.31 | 2 3.8 |
| 16 | 2 13 28.33 | +6.862 | +13 43 8.3 | +37.05 | 2 38.2 | 16 | 3 40 13.19 | +7.133 | +20 11 1.1 | +24.86 | 2 2.8 |
| 17 | 2 16 13.12 | 6.870 | 13 57 53.7 | 36.72 | 2 37.0 | 17 | 3 43 4.48 | 7.141 | 20 20 52.1 | 24.40 | 2 1.7 |
| 18 | 2 18 58.09 | 6.878 | 14 12 31.1 | 36.39 | 2 35.8 | 18 | 3 45 55.96 | 7.149 | 20 30 32.1 | 23.94 | 2 0.6 |
| 19 | 2 21 43.25 | 6.886 | 14 27 0.5 | 36.06 | 2 34.6 | 19 | 3 48 47.62 | 7.157 | 20 40 1.0 | 23.48 | 1 59.5 |
| 20 | 2 24 28.61 | 6.894 | 14 41 21.7 | 35.72 | 2 33.4 | 20 | 3 51 39.46 | 7.164 | 20 49 18.8 | 23.01 | 1 58.4 |
| 21 | 2 27 14.16 | +6.902 | +14 55 34.5 | +35.37 | 2 32.3 | 21 | 3 54 31.48 | +7.171 | +20 58 25.3 | +22.54 | 1 57.4 |
| 22 | 2 29 59.91 | 6.910 | 15 9 39.0 | 35.01 | 2 31.1 | 22 | 3 57 23.67 | 7.178 | 21 7 20.6 | 22.07 | 1 56.3 |
| 23 | 2 32 45.85 | 6.919 | 15 23 34.9 | 34.65 | 2 29.9 | 23 | 4 0 16.03 | 7.185 | 21 16 4.6 | 21.59 | 1 55.2 |
| 24 | 2 35 31.99 | 6.927 | 15 37 22.1 | 34.29 | 2 28.7 | 24 | 4 3 8.57 | 7.192 | 21 24 37.1 | 21.11 | 1 54.1 |
| 25 | 2 38 18.34 | 6.935 | 15 51 0.6 | 33.92 | 2 27.5 | 25 | 4 6 1.27 | 7.199 | 21 32 58.2 | 20.63 | 1 53.1 |
| 26 | 2 41 4.89 | +6.944 | +16 4 30.2 | +33.55 | 2 26.3 | 26 | 4 8 54.13 | +7.206 | +21 41 7.7 | +20.15 | 1 52.0 |
| 27 | 2 43 51.65 | 6.953 | 16 17 50.9 | 33.18 | 2 25.2 | 27 | 4 11 47.15 | 7.213 | 21 49 5.6 | 19.67 | 1 51.0 |
| 28 | 2 46 38.63 | 6.962 | 16 31 2.5 | 32.80 | 2 24.1 | 28 | 4 14 40.33 | 7.219 | 21 56 52.0 | 19.19 | 1 49.9 |
| 29 | 2 49 25.82 | 6.971 | 16 44 5.0 | 32.41 | 2 23.0 | 29 | 4 17 33.67 | 7.226 | 22 4 26.8 | 18.70 | 1 48.9 |
| 30 | 2 52 13.24 | 6.980 | 16 56 58.3 | 32.02 | 2 21.8 | 30 | 4 20 27.16 | 7.232 | 22 11 49.8 | 18.21 | 1 47.8 |
| 31 | 2 55 0.88 | +6.989 | +17 9 42.3 | +31.63 | 2 20.6 | 31 | 4 23 20.79 | +7.238 | +22 19 1.0 | +17.72 | 1 46.8 |
| 32 | 2 57 48.74 | +6.999 | +17 22 16.9 | +31.24 | 2 19.5 | 32 | 4 26 14.56 | +7.244 | +22 26 0.4 | +17.23 | 1 45.7 |

| Day of the Month. | 2d. | 7th. | 12th. | 17th. | 22d. | 27th. | Day of the Month. | 1st. | 6th. | 11th. | 16th. | 21st. | 26th. | 31st. |
|-------------------|------|------|-------|-------|------|-------|-------------------|------|------|-------|-------|-------|-------|-------|
| Semidiameter . . | 2'.5 | 2'.5 | 2'.4 | 2'.4 | 2'.3 | 2'.3 | Semidiameter . . | 2'.3 | 2'.2 | 2'.2 | 2'.2 | 2'.2 | 2'.1 | 2'.1 |
| Hor. Parallax . . | 4.4 | 4.3 | 4.2 | 4.2 | 4.1 | 4.1 | Hor. Parallax . . | 4.0 | 4.0 | 3.9 | 3.9 | 3.8 | 3.8 | 3.7 |

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

| MAY. | | | | | | JUNE. | | | | | |
|--|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|---|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | | |
| | h m s | s | ° ' " | " | | | h m s | s | ° ' " | " | |
| 1 | 4 23 20.79 | +7.938 | +22 19 1.0 | +17.72 | 1 46.8 | 1 | 5 53 36.67 | +7.970 | +24 21 16.8 | + 1.90 | 1 14.9 |
| 2 | 4 26 14.56 | 7.944 | 22 26 0.4 | 17.33 | 1 45.7 | 2 | 5 56 31.11 | 7.966 | 24 21 56.3 | 1.30 | 1 13.8 |
| 3 | 4 29 8.47 | 7.949 | 22 32 48.0 | 16.74 | 1 44.7 | 3 | 5 59 25.46 | 7.962 | 24 22 23.5 | 0.88 | 1 12.8 |
| 4 | 4 32 2.51 | 7.954 | 22 39 23.6 | 16.95 | 1 43.7 | 4 | 6 2 19.70 | 7.957 | 24 22 38.4 | + 0.37 | 1 11.7 |
| 5 | 4 34 56.67 | 7.959 | 22 45 47.3 | 15.76 | 1 42.6 | 5 | 6 5 13.82 | 7.952 | 24 22 41.2 | - 0.14 | 1 10.7 |
| 6 | 4 37 50.96 | +7.964 | +22 51 59.0 | +15.37 | 1 41.6 | 6 | 6 8 7.81 | +7.948 | +24 22 31.7 | - 0.65 | 1 9.6 |
| 7 | 4 40 45.35 | 7.968 | 22 57 58.6 | 14.78 | 1 40.6 | 7 | 6 11 1.68 | 7.940 | 24 22 10.1 | 1.16 | 1 8.5 |
| 8 | 4 43 39.85 | 7.972 | 23 3 46.2 | 14.37 | 1 39.5 | 8 | 6 13 55.40 | 7.934 | 24 21 36.4 | 1.66 | 1 7.5 |
| 9 | 4 46 34.44 | 7.976 | 23 9 21.6 | 13.76 | 1 38.5 | 9 | 6 16 48.96 | 7.928 | 24 20 50.6 | 2.16 | 1 6.4 |
| 10 | 4 49 29.11 | 7.980 | 23 14 44.9 | 13.94 | 1 37.5 | 10 | 6 19 42.34 | 7.921 | 24 19 52.7 | 2.66 | 1 5.4 |
| 11 | 4 52 23.86 | +7.983 | +23 19 55.9 | +13.73 | 1 36.4 | 11 | 6 22 35.58 | +7.914 | +24 18 42.8 | - 3.16 | 1 4.3 |
| 12 | 4 55 18.67 | 7.985 | 23 24 54.7 | 12.90 | 1 35.4 | 12 | 6 25 28.63 | 7.906 | 24 17 20.9 | 3.66 | 1 3.3 |
| 13 | 4 58 13.55 | 7.987 | 23 29 41.3 | 11.60 | 1 34.4 | 13 | 6 28 21.48 | 7.198 | 24 15 47.1 | 4.16 | 1 2.2 |
| 14 | 5 1 8.47 | 7.989 | 23 34 15.6 | 11.17 | 1 33.3 | 14 | 6 31 14.13 | 7.190 | 24 14 1.4 | 4.65 | 1 1.2 |
| 15 | 5 4 3.43 | 7.991 | 23 38 37.5 | 10.66 | 1 32.3 | 15 | 6 34 6.58 | 7.181 | 24 12 3.9 | 5.14 | 1 0.1 |
| 16 | 5 6 58.43 | +7.992 | +23 42 47.1 | +10.14 | 1 31.3 | 16 | 6 36 58.81 | +7.172 | +24 9 54.6 | - 5.63 | 0 59.1 |
| 17 | 5 9 53.45 | 7.992 | 23 46 44.3 | 9.63 | 1 30.2 | 17 | 6 39 50.82 | 7.163 | 24 7 33.6 | 6.19 | 0 58.0 |
| 18 | 5 12 48.49 | 7.993 | 23 50 29.1 | 9.11 | 1 29.2 | 18 | 6 42 42.60 | 7.153 | 24 5 0.9 | 6.61 | 0 56.9 |
| 19 | 5 15 43.53 | 7.993 | 23 54 1.5 | 8.60 | 1 28.1 | 19 | 6 45 34.15 | 7.143 | 24 2 16.6 | 7.09 | 0 55.8 |
| 20 | 5 18 38.57 | 7.993 | 23 57 21.6 | 8.08 | 1 27.1 | 20 | 6 48 25.46 | 7.133 | 23 59 20.8 | 7.57 | 0 54.7 |
| 21 | 5 21 33.60 | +7.992 | +24 0 29.3 | +7.56 | 1 26.1 | 21 | 6 51 16.52 | +7.122 | +23 56 13.5 | - 8.05 | 0 53.6 |
| 22 | 5 24 28.62 | 7.992 | 24 3 24.5 | 7.04 | 1 25.0 | 22 | 6 54 7.33 | 7.112 | 23 52 54.7 | 8.52 | 0 52.5 |
| 23 | 5 27 23.62 | 7.991 | 24 6 7.3 | 6.52 | 1 24.0 | 23 | 6 56 57.89 | 7.101 | 23 49 24.6 | 8.99 | 0 51.4 |
| 24 | 5 30 18.59 | 7.990 | 24 8 37.8 | 6.00 | 1 23.0 | 24 | 6 59 48.19 | 7.090 | 23 45 43.2 | 9.46 | 0 50.3 |
| 25 | 5 33 13.54 | 7.989 | 24 10 56.0 | 5.49 | 1 22.0 | 25 | 7 2 38.23 | 7.079 | 23 41 50.6 | 9.93 | 0 49.2 |
| 26 | 5 36 8.44 | +7.987 | +24 13 1.7 | +4.98 | 1 21.0 | 26 | 7 5 28.00 | +7.068 | +23 37 46.8 | -10.30 | 0 48.1 |
| 27 | 5 39 3.30 | 7.985 | 24 14 55.1 | 4.47 | 1 20.0 | 27 | 7 8 17.50 | 7.057 | 23 33 31.9 | 10.85 | 0 47.0 |
| 28 | 5 41 58.11 | 7.983 | 24 16 36.1 | 3.95 | 1 19.0 | 28 | 7 11 6.72 | 7.046 | 23 29 5.9 | 11.31 | 0 45.9 |
| 29 | 5 44 52.85 | 7.980 | 24 18 4.8 | 3.44 | 1 18.0 | 29 | 7 13 55.67 | 7.034 | 23 24 29.0 | 11.77 | 0 44.8 |
| 30 | 5 47 47.53 | 7.977 | 24 19 21.1 | 2.92 | 1 16.9 | 30 | 7 16 44.34 | 7.022 | 23 19 41.2 | 12.22 | 0 43.6 |
| 31 | 5 50 42.14 | +7.974 | +24 20 25.1 | +2.41 | 1 15.9 | 31 | 7 19 32.71 | +7.010 | +23 14 42.6 | -12.67 | 0 42.5 |
| 32 | 5 53 36.67 | +7.970 | +24 21 16.8 | +1.90 | 1 14.9 | 32 | 7 22 20.78 | +6.997 | +23 9 33.2 | -13.11 | 0 41.4 |
| Day of the Month. | | | | | | Day of the Month. | | | | | |
| 1st. 5th. 11th. 16th. 21st. 26th. 31st. | | | | | | 5th. 10th. 15th. 20th. 25th. 30th. | | | | | |
| Semidiameter . . 2.1 2.1 2.1 2.1 2.0 2.0 2.0 | | | | | | Semidiameter . . 2.0 2.0 2.0 2.0 1.9 1.9 | | | | | |
| Hor Parallax . . 3.7 3.7 3.6 3.6 3.6 3.5 3.5 | | | | | | Hor. Parallax . . 3.5 3.5 3.4 3.4 3.4 3.4 | | | | | |

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

| JULY. | | | | | | AUGUST. | | | | | |
|--|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|--|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m |
| 1 | 7 19 32.71 | +7.010 | +23 14 42.6 | -12.67 | 0 42.5 | 1 | 8 43 44.56 | +6.559 | +19 18 44.0 | -24.78 | 0 4.5 |
| 2 | 7 22 20.78 | 6.997 | 23 9 33.2 | 13.11 | 0 41.4 | 2 | 8 46 21.81 | 6.544 | 19 8 45.3 | 25.11 | 0 3.2 |
| 3 | 7 25 8.55 | 6.984 | 23 4 13.2 | 13.55 | 0 40.2 | 3 | 8 48 58.70 | 6.529 | 18 58 38.7 | 25.43 | 0 1.9 |
| 4 | 7 27 56.02 | 6.971 | 22 58 42.6 | 13.99 | 0 39.1 | 4 | 8 51 35.22 | 6.514 | 18 48 24.4 | 25.75 | 0 0.5 |
| 5 | 7 30 43.17 | 6.958 | 22 53 1.5 | 14.43 | 0 37.9 | 5 | 8 54 11.38 | 6.499 | 18 38 2.4 | 26.07 | 23 57.9 |
| 6 | 7 33 30.01 | +6.945 | +22 47 9.9 | -14.86 | 0 36.8 | 6 | 8 56 47.18 | +6.484 | +18 27 32.9 | -26.38 | 23 56.6 |
| 7 | 7 36 16.52 | 6.931 | 22 41 8.0 | 15.29 | 0 35.6 | 7 | 8 59 22.61 | 6.469 | 18 16 56.0 | 26.69 | 23 55.2 |
| 8 | 7 39 2.70 | 6.917 | 22 34 55.8 | 15.71 | 0 34.4 | 8 | 9 1 57.68 | 6.454 | 18 6 11.9 | 26.99 | 23 53.8 |
| 9 | 7 41 48.55 | 6.903 | 22 28 33.5 | 16.13 | 0 33.2 | 9 | 9 4 32.38 | 6.439 | 17 55 20.5 | 27.29 | 23 52.5 |
| 10 | 7 44 34.05 | 6.889 | 22 22 1.0 | 16.55 | 0 32.0 | 10 | 9 7 6.72 | 6.424 | 17 44 22.1 | 27.58 | 23 51.1 |
| 11 | 7 47 19.21 | +6.875 | +22 15 18.6 | -16.97 | 0 30.8 | 11 | 9 9 40.71 | +6.409 | +17 33 16.6 | -27.87 | 23 49.7 |
| 12 | 7 50 4.02 | 6.860 | 22 8 26.3 | 17.38 | 0 29.6 | 12 | 9 12 14.34 | 6.394 | 17 22 4.3 | 28.15 | 23 48.3 |
| 13 | 7 52 48.48 | 6.845 | 22 1 24.2 | 17.79 | 0 28.4 | 13 | 9 14 47.62 | 6.379 | 17 10 45.1 | 28.43 | 23 46.9 |
| 14 | 7 55 32.58 | 6.830 | 21 54 12.4 | 18.19 | 0 27.2 | 14 | 9 17 20.54 | 6.364 | 16 59 19.3 | 28.71 | 23 45.5 |
| 15 | 7 58 16.32 | 6.815 | 21 46 50.9 | 18.59 | 0 26.0 | 15 | 9 19 53.11 | 6.350 | 16 47 47.0 | 28.98 | 23 44.1 |
| 16 | 8 0 59.70 | +6.800 | +21 39 20.0 | -18.99 | 0 24.8 | 16 | 9 22 25.34 | +6.335 | +16 36 8.2 | -29.25 | 23 42.7 |
| 17 | 8 3 42.72 | 6.785 | 21 31 39.5 | 19.38 | 0 23.6 | 17 | 9 24 57.22 | 6.321 | 16 24 23.0 | 29.51 | 23 41.3 |
| 18 | 8 6 25.38 | 6.770 | 21 23 49.8 | 19.77 | 0 22.4 | 18 | 9 27 28.76 | 6.307 | 16 12 31.5 | 29.77 | 23 39.8 |
| 19 | 8 9 7.67 | 6.755 | 21 15 50.8 | 20.15 | 0 21.1 | 19 | 9 29 59.96 | 6.293 | 16 0 33.8 | 30.03 | 23 38.4 |
| 20 | 8 11 49.60 | 6.740 | 21 7 42.6 | 20.53 | 0 19.9 | 20 | 9 32 30.84 | 6.280 | 15 48 30.0 | 30.28 | 23 36.9 |
| 21 | 8 14 31.16 | +6.724 | +20 59 25.4 | -20.90 | 0 18.6 | 21 | 9 35 1.40 | +6.267 | +15 36 20.2 | -30.53 | 23 35.5 |
| 22 | 8 17 12.36 | 6.709 | 20 50 59.2 | 21.27 | 0 17.4 | 22 | 9 37 31.64 | 6.253 | 15 24 4.5 | 30.77 | 23 34.0 |
| 23 | 8 19 53.20 | 6.694 | 20 42 24.1 | 21.64 | 0 16.1 | 23 | 9 40 1.57 | 6.240 | 15 11 43.0 | 31.01 | 23 32.6 |
| 24 | 8 22 33.68 | 6.679 | 20 33 40.3 | 22.00 | 0 14.9 | 24 | 9 42 31.18 | 6.227 | 14 59 15.7 | 31.25 | 23 31.1 |
| 25 | 8 25 13.60 | 6.664 | 20 24 47.7 | 22.36 | 0 13.6 | 25 | 9 45 0.49 | 6.214 | 14 46 42.8 | 31.49 | 23 29.7 |
| 26 | 8 27 53.56 | +6.649 | +20 15 46.6 | -22.72 | 0 12.3 | 26 | 9 47 29.49 | +6.202 | +14 34 4.4 | -31.72 | 23 28.2 |
| 27 | 8 30 32.96 | 6.634 | 20 6 36.9 | 23.07 | 0 11.0 | 27 | 9 49 58.20 | 6.190 | 14 21 20.5 | 31.94 | 23 26.8 |
| 28 | 8 33 12.00 | 6.619 | 19 57 18.7 | 23.42 | 0 9.7 | 28 | 9 52 26.61 | 6.178 | 14 8 31.3 | 32.16 | 23 25.3 |
| 29 | 8 35 50.68 | 6.604 | 19 47 52.2 | 23.77 | 0 8.4 | 29 | 9 54 54.74 | 6.166 | 13 55 36.8 | 32.38 | 23 23.9 |
| 30 | 8 38 29.00 | 6.589 | 19 38 17.5 | 24.11 | 0 7.1 | 30 | 9 57 22.57 | 6.154 | 13 42 37.1 | 32.59 | 23 22.4 |
| 31 | 8 41 6.96 | +6.574 | +19 28 34.8 | -24.45 | 0 5.8 | 31 | 9 59 50.12 | +6.142 | +13 29 32.4 | -32.80 | 23 20.9 |
| 32 | 8 43 44.56 | +6.559 | +19 18 44.0 | -24.78 | 0 4.5 | 32 | 10 2 17.39 | +6.130 | +13 16 22.8 | -33.00 | 23 19.4 |
| Day of the Month. | | | | | | Day of the Month. | | | | | |
| 5th. 10th. 15th. 20th. 25th. 30th. | | | | | | 4th. 9th. 14th. 19th. 24th. 29th. | | | | | |
| Semidiameter . . 1".9 1".9 1".9 1".9 1".9 1".9 | | | | | | Semidiameter . . 1".9 1".9 1".9 1".9 1".9 1".9 | | | | | |
| Hor. Parallax . . 3.4 3.4 3.3 3.3 3.3 3.3 | | | | | | Hor. Parallax . . 3.3 3.3 3.3 3.3 3.3 3.3 | | | | | |

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

| GREENWICH MEAN TIME. | | | | | | | | | | | |
|---|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|---|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|
| SEPTEMBER. | | | | | | OCTOBER. | | | | | |
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ' " | " | | | h m | h m s | s | ° ' " | |
| 1 | 10 2 17.39 | +6.130 | +13 16 22.8 | -33.00 | 23 19.4 | 1 | 11 14 5.62 | +5.871 | +6 11 27.9 | -37.94 | 22 32.9 |
| 2 | 10 4 44.38 | 6.119 | 13 3 8.3 | 33.90 | 23 17.9 | 2 | 11 16 26.47 | 5.866 | 5 56 33.2 | 37.33 | 22 31.3 |
| 3 | 10 7 11.10 | 6.107 | 12 49 49.1 | 33.40 | 23 16.4 | 3 | 11 18 47.20 | 5.861 | 5 41 36.6 | 37.41 | 22 29.7 |
| 4 | 10 9 37.55 | 6.096 | 12 36 25.2 | 33.59 | 23 14.9 | 4 | 11 21 7.81 | 5.856 | 5 26 38.2 | 37.49 | 22 28.1 |
| 5 | 10 12 3.72 | 6.085 | 12 22 56.8 | 33.78 | 23 13.4 | 5 | 11 23 28.30 | 5.852 | 5 11 38.1 | 37.56 | 22 26.5 |
| 6 | 10 14 29.62 | +6.074 | +12 9 24.0 | -33.96 | 23 11.9 | 6 | 11 25 48.68 | +5.847 | +4 56 36.5 | -37.69 | 22 24.9 |
| 7 | 10 16 55.26 | 6.063 | 11 55 46.9 | 34.14 | 23 10.3 | 7 | 11 28 8.95 | 5.842 | 4 41 33.4 | 37.67 | 22 23.3 |
| 8 | 10 19 20.64 | 6.052 | 11 42 5.6 | 34.31 | 23 8.8 | 8 | 11 30 29.12 | 5.838 | 4 26 28.9 | 37.72 | 22 21.7 |
| 9 | 10 21 45.77 | 6.041 | 11 28 20.2 | 34.48 | 23 7.3 | 9 | 11 32 49.20 | 5.834 | 4 11 23.1 | 37.76 | 22 20.1 |
| 10 | 10 24 10.65 | 6.031 | 11 14 30.8 | 34.64 | 23 5.8 | 10 | 11 35 9.18 | 5.831 | 3 56 16.2 | 37.81 | 22 18.5 |
| 11 | 10 26 35.28 | +6.021 | +11 0 37.5 | -34.80 | 23 4.2 | 11 | 11 37 29.08 | +5.826 | +3 41 8.2 | -37.85 | 22 16.9 |
| 12 | 10 28 59.67 | 6.011 | 10 46 40.4 | 34.96 | 23 2.7 | 12 | 11 39 48.90 | 5.825 | 3 25 59.2 | 37.89 | 22 15.2 |
| 13 | 10 31 23.82 | 6.001 | 10 32 39.5 | 35.11 | 23 1.1 | 13 | 11 42 8.66 | 5.822 | 3 10 49.2 | 37.93 | 22 13.6 |
| 14 | 10 33 47.75 | 5.992 | 10 18 35.0 | 35.26 | 22 59.6 | 14 | 11 44 28.35 | 5.819 | 2 55 38.3 | 37.97 | 22 12.0 |
| 15 | 10 36 11.45 | 5.983 | 10 4 26.9 | 35.41 | 22 58.0 | 15 | 11 46 47.98 | 5.817 | 2 40 26.7 | 38.00 | 22 10.4 |
| 16 | 10 38 34.94 | +5.974 | + 9 50 15.4 | -35.55 | 22 56.5 | 16 | 11 49 7.56 | +5.815 | +2 25 14.5 | -38.09 | 22 8.8 |
| 17 | 10 40 58.92 | 5.966 | 9 36 0.6 | 35.69 | 22 54.9 | 17 | 11 51 27.10 | 5.813 | 2 10 1.6 | 38.04 | 22 7.2 |
| 18 | 10 43 21.29 | 5.958 | 9 21 42.5 | 35.82 | 22 53.3 | 18 | 11 53 46.60 | 5.812 | 1 54 48.3 | 38.06 | 22 5.6 |
| 19 | 10 45 44.17 | 5.950 | 9 7 21.1 | 35.95 | 22 51.8 | 19 | 11 56 6.07 | 5.811 | 1 39 34.5 | 38.08 | 22 4.0 |
| 20 | 10 48 6.86 | 5.942 | 8 52 56.7 | 36.08 | 22 50.2 | 20 | 11 58 25.52 | 5.810 | 1 24 20.3 | 36.10 | 22 2.4 |
| 21 | 10 50 29.37 | +5.934 | + 8 38 29.2 | -36.30 | 22 48.7 | 21 | 12 0 44.96 | +5.810 | +1 9 5.9 | -38.11 | 22 0.7 |
| 22 | 10 52 51.70 | 5.927 | 8 23 58.8 | 36.32 | 22 47.1 | 22 | 12 3 4.40 | 5.810 | 0 53 51.2 | 38.12 | 21 59.1 |
| 23 | 10 55 13.86 | 5.920 | 8 9 25.6 | 36.44 | 22 45.6 | 23 | 12 5 23.82 | 5.810 | 0 38 36.5 | 38.12 | 21 57.5 |
| 24 | 10 57 35.85 | 5.913 | 7 54 49.6 | 36.56 | 22 44.0 | 24 | 12 7 43.25 | 5.810 | 0 23 21.7 | 38.11 | 21 55.9 |
| 25 | 10 59 57.69 | 5.906 | 7 40 10.9 | 36.67 | 22 42.4 | 25 | 12 10 2.69 | 5.811 | +0 8 7.0 | 38.10 | 21 54.2 |
| 26 | 11 2 19.37 | +5.900 | + 7 25 29.6 | -36.77 | 22 40.8 | 26 | 12 12 22.14 | +5.811 | -0 7 7.5 | -38.09 | 21 52.6 |
| 27 | 11 4 40.90 | 5.894 | 7 10 45.8 | 36.87 | 22 39.2 | 27 | 12 14 41.61 | 5.812 | 0 22 21.7 | 38.08 | 21 51.0 |
| 28 | 11 7 2.29 | 5.888 | 6 55 59.7 | 36.97 | 22 37.7 | 28 | 12 17 1.09 | 5.812 | 0 37 35.5 | 38.06 | 21 49.4 |
| 29 | 11 9 23.54 | 5.882 | 6 41 11.2 | 37.06 | 22 36.1 | 29 | 12 19 20.60 | 5.813 | 0 52 48.9 | 38.04 | 21 47.8 |
| 30 | 11 11 44.65 | 5.876 | 6 26 20.6 | 37.15 | 22 34.5 | 30 | 12 21 40.14 | 5.814 | 1 8 1.7 | 38.01 | 21 46.1 |
| 31 | 11 14 5.62 | +5.871 | + 6 11 27.9 | -37.94 | 22 32.9 | 31 | 12 23 59.71 | +5.816 | -1 23 13.8 | -37.98 | 21 44.5 |
| 32 | 11 16 26.47 | +5.866 | + 5 56 33.2 | -37.33 | 22 31.3 | 32 | 12 26 19.32 | +5.816 | -1 38 25.1 | -37.95 | 21 42.9 |
| Day of the Month. | | | | | | Day of the Month. | | | | | |
| 3d. 8th. 13th. 18th. 23d. 28th. | | | | | | 3d. 8th. 13th. 18th. 23d. 28th. | | | | | |
| Semidiameter . . 1.9 1.9 1.9 1.9 2.0 2.0 | | | | | | Semidiameter . . 2.0 2.0 2.0 2.0 2.1 2.1 | | | | | |
| Hor. Parallax . . 3.3 3.4 3.4 3.4 3.4 3.4 | | | | | | Hor. Parallax . . 3.5 3.5 3.5 3.6 3.6 3.6 | | | | | |
| NOTE.—The sign + indicates north declinations; the sign — indicates south declinations. | | | | | | | | | | | |

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

| NOVEMBER. | | | | | | DECEMBER. | | | | | | | | | | |
|---------------------|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|---------------|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|-------|-------|------|-------|------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | | | | | |
| Noon. | Noon. | Noon. | Noon. | Noon. | | Noon. | Noon. | Noon. | Noon. | | | | | | | |
| h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m | | | | | | |
| 1 12 26 19.32 | +5.818 | -1 38 25.1 | -37.95 | 21 42.9 | 1 13 36 49.45 | +5.963 | -9 0 16.1 | -25.19 | 20 55.2 | | | | | | | |
| 2 12 28 38.97 | 5.820 | 1 53 35.6 | 37.91 | 21 41.3 | 2 13 39 12.67 | 5.970 | 9 14 17.1 | 34.96 | 20 53.7 | | | | | | | |
| 3 12 30 58.67 | 5.822 | 2 8 45.1 | 37.87 | 21 39.7 | 3 13 41 36.06 | 5.978 | 9 28 14.4 | 34.80 | 20 52.1 | | | | | | | |
| 4 12 33 18.41 | 5.824 | 2 23 53.4 | 37.82 | 21 38.1 | 4 13 43 59.63 | 5.986 | 9 42 7.7 | 34.63 | 20 50.6 | | | | | | | |
| 5 12 35 38.20 | 5.826 | 2 39 0.5 | 37.77 | 21 36.5 | 5 13 46 23.39 | 5.994 | 9 55 57.0 | 34.46 | 20 49.0 | | | | | | | |
| 6 12 37 58.05 | +5.828 | -2 54 6.4 | -37.71 | 21 34.9 | 6 13 48 47.33 | +6.003 | -10 9 42.1 | -34.29 | 20 47.5 | | | | | | | |
| 7 12 40 17.97 | 5.831 | 3 9 10.9 | 37.65 | 21 33.2 | 7 13 51 11.46 | 6.010 | 10 23 23.1 | 34.12 | 20 45.9 | | | | | | | |
| 8 12 42 37.95 | 5.834 | 3 24 13.8 | 37.59 | 21 31.6 | 8 13 53 35.79 | 6.018 | 10 36 59.8 | 33.94 | 20 44.4 | | | | | | | |
| 9 12 44 58.00 | 5.837 | 3 39 15.2 | 37.52 | 21 30.0 | 9 13 56 0.32 | 6.026 | 10 50 32.1 | 33.75 | 20 42.9 | | | | | | | |
| 10 12 47 18.13 | 5.841 | 3 54 15.0 | 37.45 | 21 28.4 | 10 13 58 25.04 | 6.035 | 11 3 59.9 | 33.56 | 20 41.4 | | | | | | | |
| 11 12 49 38.35 | +5.845 | -4 9 13.0 | -37.38 | 21 26.8 | 11 14 0 49.98 | +6.043 | -11 17 23.2 | -33.37 | 20 39.9 | | | | | | | |
| 12 12 51 58.66 | 5.849 | 4 24 9.2 | 37.30 | 21 25.2 | 12 14 3 15.13 | 6.052 | 11 30 41.9 | 33.18 | 20 38.3 | | | | | | | |
| 13 12 54 19.07 | 5.853 | 4 39 3.5 | 37.22 | 21 23.6 | 13 14 5 40.49 | 6.061 | 11 43 55.9 | 32.98 | 20 36.8 | | | | | | | |
| 14 12 56 39.58 | 5.857 | 4 53 55.8 | 37.13 | 21 22.0 | 14 14 8 6.07 | 6.070 | 11 57 5.1 | 32.78 | 20 35.3 | | | | | | | |
| 15 12 59 0.20 | 5.862 | 5 8 46.0 | 37.04 | 21 20.4 | 15 14 10 31.88 | 6.080 | 12 10 9.4 | 32.57 | 20 33.8 | | | | | | | |
| 16 13 1 20.94 | +5.867 | -5 23 34.0 | -36.95 | 21 18.8 | 16 14 12 57.92 | +6.090 | -12 23 8.8 | -32.36 | 20 32.3 | | | | | | | |
| 17 13 3 41.80 | 5.872 | 5 38 19.8 | 36.86 | 21 17.2 | 17 14 15 24.19 | 6.099 | 12 36 3.2 | 32.15 | 20 30.8 | | | | | | | |
| 18 13 6 2.80 | 5.877 | 5 53 3.3 | 36.76 | 21 15.6 | 18 14 17 50.69 | 6.109 | 12 48 52.5 | 31.94 | 20 29.3 | | | | | | | |
| 19 13 8 23.93 | 5.883 | 6 7 44.5 | 36.66 | 21 14.0 | 19 14 20 17.43 | 6.119 | 13 1 36.6 | 31.73 | 20 27.8 | | | | | | | |
| 20 13 10 45.20 | 5.889 | 6 22 23.1 | 36.55 | 21 12.4 | 20 14 22 44.41 | 6.129 | 13 14 15.3 | 31.50 | 20 26.3 | | | | | | | |
| 21 13 13 6.61 | +5.895 | -6 36 59.2 | -36.44 | 21 10.9 | 21 14 25 11.64 | +6.139 | -13 26 48.7 | -31.27 | 20 24.8 | | | | | | | |
| 22 13 15 28.17 | 5.901 | 6 51 32.6 | 36.33 | 21 9.3 | 22 14 27 39.11 | 6.150 | 13 39 16.6 | 31.04 | 20 23.3 | | | | | | | |
| 23 13 17 49.88 | 5.907 | 7 6 3.2 | 36.22 | 21 7.7 | 23 14 30 6.82 | 6.160 | 13 51 39.0 | 30.81 | 20 21.9 | | | | | | | |
| 24 13 20 11.75 | 5.914 | 7 20 30.9 | 36.10 | 21 6.1 | 24 14 32 34.77 | 6.170 | 14 3 55.6 | 30.57 | 20 20.4 | | | | | | | |
| 25 13 22 33.78 | 5.921 | 7 34 55.7 | 35.97 | 21 4.5 | 25 14 35 2.96 | 6.180 | 14 16 6.5 | 30.33 | 20 19.0 | | | | | | | |
| 26 13 24 55.97 | +5.928 | -7 49 17.4 | -35.84 | 21 3.0 | 26 14 37 31.39 | +6.190 | -14 28 11.4 | -30.08 | 20 17.5 | | | | | | | |
| 27 13 27 18.33 | 5.935 | 8 3 35.9 | 35.71 | 21 1.4 | 27 14 40 0.07 | 6.200 | 14 40 10.4 | 29.83 | 20 16.0 | | | | | | | |
| 28 13 29 40.85 | 5.942 | 8 17 51.1 | 35.57 | 20 59.9 | 28 14 42 28.98 | 6.210 | 14 52 3.3 | 29.57 | 20 14.6 | | | | | | | |
| 29 13 32 3.54 | 5.949 | 8 32 3.0 | 35.42 | 20 58.3 | 29 14 44 58.14 | 6.220 | 15 3 50.0 | 29.31 | 20 13.1 | | | | | | | |
| 30 13 34 26.41 | 5.956 | 8 46 11.3 | 35.27 | 20 56.8 | 30 14 47 27.52 | 6.230 | 15 15 30.4 | 29.05 | 20 11.7 | | | | | | | |
| 31 13 36 49.45 | +5.963 | -9 0 16.1 | -35.12 | 20 55.2 | 31 14 49 57.14 | +6.239 | -15 27 4.4 | -28.78 | 20 10.2 | | | | | | | |
| 32 13 39 12.67 | +5.970 | -9 14 17.1 | -34.96 | 20 53.7 | 32 14 52 27.00 | +6.249 | -15 38 31.9 | -28.51 | 20 8.8 | | | | | | | |
| <hr/> | | | | | | <hr/> | | | | | | | | | | |
| Day of the Month. | | 2d. | 7th. | 12th. | 17th. | 22d. | 27th. | Day of the Month. | | 2d. | 7th. | 12th. | 17th. | 22d. | 27th. | 32d. |
| Semidiameter . . . | | 2.1 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | Semidiameter . . | | 2.3 | 2.3 | 2.3 | 2.4 | 2.4 | 2.5 | 2.5 |
| Hor. Parallax . . . | | 3.7 | 3.7 | 3.8 | 3.8 | 3.9 | 3.9 | Hor. Parallax . . | | 4.0 | 4.1 | 4.1 | 4.2 | 4.3 | 4.4 | 4.5 |

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

| JANUARY. | | | | | | FEBRUARY. | | | | | |
|-------------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|-------------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| Noon. | Noon. | Noon. | Noon. | Noon. | | Noon. | Noon. | Noon. | Noon. | | |
| h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | | h m |
| 1 | 21 9 10.98 | +2.190 | -17 10 55.7 | + 9.58 | 2 25.5 | 1 | 21 37 31.14 | +2.340 | -14 59 29.1 | +11.46 | 0 51.8 |
| 2 | 21 10 3.66 | 2.199 | 17 7 5.0 | 9.65 | 2 22.4 | 2 | 21 38 27.32 | 2.341 | 14 54 53.7 | 11.51 | 0 48.8 |
| 3 | 21 10 56.54 | 2.208 | 17 3 12.4 | 9.73 | 2 19.4 | 3 | 21 39 23.52 | 2.342 | 14 50 17.1 | 11.55 | 0 45.8 |
| 4 | 21 11 49.62 | 2.216 | 16 59 18.1 | 9.80 | 2 16.3 | 4 | 21 40 19.74 | 2.343 | 14 45 39.5 | 11.59 | 0 42.8 |
| 5 | 21 12 42.90 | 2.224 | 16 55 22.0 | 9.87 | 2 13.3 | 5 | 21 41 15.98 | 2.343 | 14 41 1.0 | 11.63 | 0 39.8 |
| 6 | 21 13 36.36 | +2.232 | -16 51 24.2 | + 9.95 | 2 10.2 | 6 | 21 42 12.22 | +2.344 | -14 36 21.5 | +11.67 | 0 36.8 |
| 7 | 21 14 30.01 | 2.229 | 16 47 24.6 | 10.02 | 2 7.2 | 7 | 21 43 8.47 | 2.344 | 14 31 41.1 | 11.70 | 0 33.8 |
| 8 | 21 15 23.83 | 2.246 | 16 43 23.3 | 10.09 | 2 4.1 | 8 | 21 44 4.72 | 2.343 | 14 26 59.8 | 11.74 | 0 30.8 |
| 9 | 21 16 17.62 | 2.253 | 16 39 20.4 | 10.16 | 2 1.1 | 9 | 21 45 0.96 | 2.343 | 14 22 17.7 | 11.78 | 0 27.8 |
| 10 | 21 17 11.98 | 2.260 | 16 35 15.8 | 10.23 | 1 58.1 | 10 | 21 45 57.19 | 2.342 | 14 17 34.8 | 11.81 | 0 24.8 |
| 11 | 21 18 6.29 | +2.266 | -16 31 9.6 | +10.29 | 1 55.0 | 11 | 21 46 53.39 | +2.341 | -14 12 51.0 | +11.84 | 0 21.8 |
| 12 | 21 19 0.74 | 2.272 | 16 27 1.8 | 10.36 | 1 52.0 | 12 | 21 47 49.57 | 2.340 | 14 8 6.6 | 11.87 | 0 18.8 |
| 13 | 21 19 55.33 | 2.278 | 16 22 52.4 | 10.43 | 1 49.0 | 13 | 21 48 45.72 | 2.339 | 14 3 21.4 | 11.90 | 0 15.8 |
| 14 | 21 20 50.05 | 2.283 | 16 18 41.5 | 10.49 | 1 46.0 | 14 | 21 49 41.83 | 2.337 | 13 58 35.5 | 11.93 | 0 12.8 |
| 15 | 21 21 44.91 | 2.288 | 16 14 29.0 | 10.55 | 1 42.9 | 15 | 21 50 37.90 | 2.335 | 13 53 49.0 | 11.96 | 0 9.8 |
| 16 | 21 22 39.68 | +2.293 | -16 10 15.0 | +10.61 | 1 39.9 | 16 | 21 51 33.93 | +2.333 | -13 49 1.8 | +11.98 | 0 6.8 |
| 17 | 21 23 34.97 | 2.298 | 16 5 59.6 | 10.67 | 1 36.9 | 17 | 21 52 29.90 | 2.331 | 13 44 14.1 | 12.00 | 0 3.8 |
| 18 | 21 24 30.17 | 2.302 | 16 1 42.7 | 10.73 | 1 33.9 | 18 | 21 53 25.82 | 2.329 | 13 39 25.9 | 12.02 | 0 0.8 |
| 19 | 21 25 25.46 | 2.306 | 15 57 24.4 | 10.79 | 1 30.8 | 19 | 21 54 21.67 | 2.326 | 13 34 37.1 | 12.04 | 23 54.8 |
| 20 | 21 26 20.86 | 2.310 | 15 53 4.7 | 10.85 | 1 27.8 | 20 | 21 55 17.46 | 2.323 | 13 29 47.9 | 12.06 | 23 51.8 |
| 21 | 21 27 16.34 | +2.314 | -15 48 43.7 | +10.91 | 1 24.8 | 21 | 21 56 13.18 | +2.320 | -13 24 58.3 | +12.08 | 23 48.7 |
| 22 | 21 28 11.91 | 2.317 | 15 44 21.3 | 10.97 | 1 21.8 | 22 | 21 57 8.83 | 2.317 | 13 20 8.2 | 12.09 | 23 45.7 |
| 23 | 21 29 7.56 | 2.320 | 15 39 57.6 | 11.02 | 1 18.8 | 23 | 21 58 4.40 | 2.314 | 13 15 17.7 | 12.11 | 23 42.7 |
| 24 | 21 30 3.28 | 2.323 | 15 35 32.6 | 11.07 | 1 15.8 | 24 | 21 58 59.89 | 2.311 | 13 10 26.9 | 12.13 | 23 39.7 |
| 25 | 21 30 59.07 | 2.326 | 15 31 6.4 | 11.12 | 1 12.8 | 25 | 21 59 55.29 | 2.307 | 13 5 35.7 | 12.14 | 23 36.7 |
| 26 | 21 31 54.92 | +2.329 | -15 26 38.8 | +11.17 | 1 9.8 | 26 | 22 0 50.61 | +2.303 | -13 0 44.2 | +12.15 | 23 33.7 |
| 27 | 21 32 50.84 | 2.331 | 15 22 10.1 | 11.22 | 1 6.8 | 27 | 22 1 45.83 | 2.300 | 12 55 52.5 | 12.16 | 23 30.7 |
| 28 | 21 33 46.81 | 2.333 | 15 17 40.2 | 11.27 | 1 3.8 | 28 | 22 2 40.96 | 2.295 | 12 51 0.5 | 12.17 | 23 27.6 |
| 29 | 21 34 42.83 | 2.335 | 15 13 9.1 | 11.32 | 1 0.8 | 29 | 22 3 35.98 | 2.291 | 12 46 8.4 | 12.18 | 23 24.6 |
| 30 | 21 35 38.89 | 2.337 | 15 8 36.9 | 11.37 | 0 57.8 | 30 | 22 4 30.90 | 2.286 | 12 41 16.1 | 12.18 | 23 21.6 |
| 31 | 21 36 35.00 | +2.339 | -15 4 3.6 | +11.42 | 0 54.8 | 31 | 22 5 25.71 | +2.281 | -12 36 23.6 | +12.19 | 23 18.6 |
| 32 | 21 37 31.14 | +2.340 | -14 59 29.1 | +11.46 | 0 51.8 | 32 | 22 6 20.40 | +2.276 | -12 31 31.0 | +12.19 | 23 15.6 |
| Day of the Month. | 1st. | 9th. | 17th. | 25th. | | Day of the Month. | 2d. | 10th. | 18th. | 26th. | |
| Polar Semidiameter . . | 16".2 | 16".0 | 15".8 | 15".7 | | Polar Semidiameter . . | 15".7 | 15".7 | 15".7 | 15".7 | |
| Horizontal Parallax . . | 1.5 | 1.5 | 1.5 | 1.5 | | Horizontal Parallax . . | 1.5 | 1.5 | 1.5 | 1.5 | |

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

| MAY. | | | | | | JUNE. | | | | | |
|-------------------------|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|-------------------------|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| Noon. | Noon. | Noon. | Noon. | Noon. | | Noon. | Noon. | Noon. | Noon. | | |
| h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m | |
| 1 | 22 53 12.42 | +1.654 | -8 8 8.7 | +9.57 | 20 14.0 | 1 | 23 10 2.81 | +1.025 | -6 31 35.6 | +5.72 | 18 28.6 |
| 2 | 22 53 51.92 | 1.637 | 8 4 20.1 | 9.47 | 20 10.7 | 2 | 23 10 27.12 | 1.001 | 6 29 20.3 | 5.57 | 18 25.1 |
| 3 | 22 54 31.02 | 1.620 | 8 0 33.9 | 9.37 | 20 7.4 | 3 | 23 10 50.84 | 0.977 | 6 27 8.6 | 5.41 | 18 21.5 |
| 4 | 22 55 9.70 | 1.603 | 7 56 50.1 | 9.27 | 20 4.1 | 4 | 23 11 13.98 | 0.952 | 6 25 0.7 | 5.25 | 18 18.0 |
| 5 | 22 55 47.97 | 1.586 | 7 53 8.7 | 9.17 | 20 0.8 | 5 | 23 11 36.52 | 0.927 | 6 22 56.6 | 5.00 | 18 14.4 |
| 6 | 22 56 25.81 | +1.568 | -7 49 29.8 | +9.07 | 19 57.5 | 6 | 23 11 59.45 | +0.902 | -6 20 56.4 | +4.93 | 18 10.8 |
| 7 | 22 57 3.23 | 1.550 | 7 45 53.4 | 8.96 | 19 54.2 | 7 | 23 12 19.77 | 0.876 | 6 19 0.0 | 4.77 | 18 7.2 |
| 8 | 22 57 40.20 | 1.532 | 7 42 19.6 | 8.85 | 19 50.8 | 8 | 23 12 40.48 | 0.850 | 6 17 7.6 | 4.61 | 18 3.6 |
| 9 | 22 58 16.74 | 1.513 | 7 38 48.4 | 8.74 | 19 47.5 | 9 | 23 13 0.58 | 0.824 | 6 15 19.1 | 4.44 | 18 0.0 |
| 10 | 22 58 52.83 | 1.494 | 7 35 19.9 | 8.63 | 19 44.1 | 10 | 23 13 20.05 | 0.798 | 6 13 34.6 | 4.27 | 17 56.4 |
| 11 | 22 59 28.46 | +1.475 | -7 31 54.1 | +8.52 | 19 40.8 | 11 | 23 13 38.88 | +0.772 | -6 11 54.2 | +4.10 | 17 52.8 |
| 12 | 23 0 3.64 | 1.456 | 7 28 31.1 | 8.40 | 19 37.4 | 12 | 23 13 57.09 | 0.746 | 6 10 17.8 | 3.93 | 17 49.1 |
| 13 | 23 0 38.35 | 1.437 | 7 25 11.0 | 8.28 | 19 34.1 | 13 | 23 14 14.66 | 0.719 | 6 8 45.5 | 3.78 | 17 45.5 |
| 14 | 23 1 12.59 | 1.417 | 7 21 53.7 | 8.16 | 19 30.7 | 14 | 23 14 31.58 | 0.692 | 6 7 17.3 | 3.59 | 17 41.8 |
| 15 | 23 1 46.36 | 1.397 | 7 18 39.2 | 8.04 | 19 27.3 | 15 | 23 14 47.86 | 0.665 | 6 5 53.2 | 3.42 | 17 38.2 |
| 16 | 23 2 19.65 | +1.377 | -7 15 27.7 | +7.92 | 19 23.9 | 16 | 23 15 3.49 | +0.638 | -6 4 33.3 | +3.24 | 17 34.5 |
| 17 | 23 2 52.45 | 1.357 | 7 12 19.2 | 7.79 | 19 20.5 | 17 | 23 15 18.46 | 0.611 | 6 3 17.6 | 3.07 | 17 30.8 |
| 18 | 23 3 24.77 | 1.337 | 7 9 13.7 | 7.67 | 19 17.1 | 18 | 23 15 32.77 | 0.583 | 6 2 6.2 | 2.89 | 17 27.1 |
| 19 | 23 3 56.59 | 1.316 | 7 6 11.2 | 7.54 | 19 13.7 | 19 | 23 15 46.43 | 0.555 | 6 0 58.9 | 2.71 | 17 23.4 |
| 20 | 23 4 27.91 | 1.295 | 7 3 11.9 | 7.41 | 19 10.3 | 20 | 23 15 59.41 | 0.527 | 5 59 56.0 | 2.53 | 17 19.6 |
| 21 | 23 4 58.72 | +1.274 | -7 0 15.7 | +7.28 | 19 6.9 | 21 | 23 16 11.73 | +0.499 | -5 58 57.4 | +2.35 | 17 15.9 |
| 22 | 23 5 29.03 | 1.252 | 6 57 22.6 | 7.15 | 19 3.5 | 22 | 23 16 23.37 | 0.471 | 5 58 3.1 | 2.17 | 17 12.2 |
| 23 | 23 5 58.82 | 1.230 | 6 54 32.8 | 7.01 | 19 0.1 | 23 | 23 16 34.33 | 0.443 | 5 57 13.1 | 1.99 | 17 8.4 |
| 24 | 23 6 28.09 | 1.208 | 6 51 46.2 | 6.87 | 18 56.6 | 24 | 23 16 44.61 | 0.414 | 5 56 27.4 | 1.81 | 17 4.6 |
| 25 | 23 6 56.84 | 1.186 | 6 49 2.9 | 6.73 | 18 53.2 | 25 | 23 16 54.19 | 0.385 | 5 55 46.3 | 1.62 | 17 0.9 |
| 26 | 23 7 25.05 | +1.164 | -6 46 22.9 | +6.59 | 18 49.7 | 26 | 23 17 3.09 | +0.356 | -5 55 9.5 | +1.44 | 16 57.1 |
| 27 | 23 7 52.73 | 1.142 | 6 43 46.3 | 6.45 | 18 46.2 | 27 | 23 17 11.28 | 0.327 | 5 54 37.2 | 1.26 | 16 53.2 |
| 28 | 23 8 19.86 | 1.119 | 6 41 13.1 | 6.31 | 18 42.7 | 28 | 23 17 18.78 | 0.298 | 5 54 9.3 | 1.07 | 16 49.4 |
| 29 | 23 8 46.44 | 1.096 | 6 38 43.4 | 6.16 | 18 39.2 | 29 | 23 17 25.57 | 0.269 | 5 53 45.9 | 0.88 | 16 45.6 |
| 30 | 23 9 12.46 | 1.073 | 6 36 17.2 | 6.02 | 18 35.7 | 30 | 23 17 31.65 | 0.239 | 5 53 27.1 | 0.69 | 16 41.8 |
| 31 | 23 9 37.92 | +1.049 | -6 33 54.6 | +5.87 | 18 32.2 | 31 | 23 17 37.01 | +0.209 | -5 53 12.8 | +0.50 | 19 37.9 |
| 32 | 23 10 2.81 | +1.025 | -6 31 35.6 | +5.72 | 18 28.6 | 32 | 23 17 41.66 | +0.179 | -5 53 3.1 | +0.31 | 16 34.1 |
| Day of the Month. | | 1st. | 9th. | 17th. | 25th. | Day of the Month. | | 2d. | 10th. | 18th. | 26th. |
| Polar Semidiameter . . | | 17".3 | 17".6 | 18".0 | 18".5 | Polar Semidiameter . . | | 18".9 | 19".4 | 19".9 | 20".4 |
| Horizontal Parallax . . | | 1.6 | 1.7 | 1.7 | 1.7 | Horizontal Parallax . . | | 1.8 | 1.8 | 1.9 | 1.9 |

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

| JULY. | | | | | | AUGUST. | | | | | |
|-------------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|-------------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m |
| 1 | 23 17 37.01 | +0.209 | -5 53 12.8 | +0.50 | 16 37.9 | 1 | 23 14 28.63 | -0.697 | -6 22 54.1 | -5.11 | 14 32.7 |
| 2 | 23 17 41.66 | 0.179 | 5 53 3.1 | 0.31 | 16 34.1 | 2 | 23 14 11.58 | 0.793 | 6 24 58.7 | 5.97 | 14 28.5 |
| 3 | 23 17 45.60 | 0.149 | 5 52 58.0 | +0.19 | 16 30.2 | 3 | 23 13 53.90 | 0.749 | 6 27 6.8 | 5.49 | 14 24.2 |
| 4 | 23 17 48.81 | 0.119 | 5 52 57.4 | -0.08 | 16 26.3 | 4 | 23 13 35.62 | 0.774 | 6 29 18.6 | 5.57 | 14 20.0 |
| 5 | 23 17 51.29 | 0.089 | 5 53 1.4 | -0.97 | 16 22.4 | 5 | 23 13 16.74 | 0.799 | 6 31 33.9 | 5.71 | 14 15.8 |
| 6 | 23 17 53.05 | +0.059 | -5 53 10.0 | -0.46 | 16 18.5 | 6 | 23 12 57.27 | -0.893 | -6 33 52.6 | -5.86 | 14 11.5 |
| 7 | 23 17 54.09 | +0.098 | 5 53 23.2 | 0.65 | 16 14.6 | 7 | 23 12 37.22 | 0.847 | 6 36 14.6 | 5.98 | 14 7.2 |
| 8 | 23 17 54.39 | -0.002 | 5 53 41.0 | 0.84 | 16 10.6 | 8 | 23 12 16.61 | 0.870 | 6 38 39.8 | 6.11 | 14 2.9 |
| 9 | 23 17 53.97 | 0.023 | 5 54 3.5 | 1.03 | 16 6.7 | 9 | 23 11 55.46 | 0.893 | 6 41 8.1 | 6.24 | 13 58.7 |
| 10 | 23 17 52.82 | 0.063 | 5 54 20.5 | 1.22 | 16 2.7 | 10 | 23 11 33.76 | 0.915 | 6 43 39.4 | 6.36 | 13 54.4 |
| 11 | 23 17 50.95 | -0.093 | -5 55 2.0 | -1.41 | 15 58.8 | 11 | 23 11 11.55 | -0.936 | -6 46 13.7 | -6.48 | 13 50.0 |
| 12 | 23 17 48.36 | 0.123 | 5 55 38.1 | 1.60 | 15 54.8 | 12 | 23 10 48.84 | 0.957 | 6 48 50.7 | 6.60 | 13 45.8 |
| 13 | 23 17 45.04 | 0.153 | 5 56 18.8 | 1.79 | 15 50.8 | 13 | 23 10 25.64 | 0.977 | 6 51 30.4 | 6.71 | 13 41.4 |
| 14 | 23 17 41.00 | 0.183 | 5 57 4.0 | 1.98 | 15 46.8 | 14 | 23 10 1.96 | 0.996 | 6 54 12.7 | 6.81 | 13 37.1 |
| 15 | 23 17 36.25 | 0.213 | 5 57 53.6 | 2.17 | 15 42.7 | 15 | 23 9 37.82 | 1.015 | 6 56 57.4 | 6.91 | 13 32.8 |
| 16 | 23 17 30.78 | -0.243 | -5 58 47.7 | -2.35 | 15 38.7 | 16 | 23 9 13.25 | -1.033 | -6 59 44.5 | -7.00 | 13 28.4 |
| 17 | 23 17 24.59 | 0.273 | 5 59 46.3 | 2.54 | 15 34.7 | 17 | 23 8 48.25 | 1.050 | 7 2 33.8 | 7.09 | 13 24.1 |
| 18 | 23 17 17.70 | 0.302 | 6 0 49.2 | 2.72 | 15 30.6 | 18 | 23 8 22.83 | 1.067 | 7 5 25.2 | 7.18 | 13 19.7 |
| 19 | 23 17 10.09 | 0.331 | 6 1 56.6 | 2.90 | 15 26.6 | 19 | 23 7 57.02 | 1.083 | 7 8 18.6 | 7.26 | 13 15.3 |
| 20 | 23 17 1.79 | 0.361 | 6 3 8.3 | 3.08 | 15 22.5 | 20 | 23 7 30.84 | 1.098 | 7 11 13.9 | 7.34 | 13 11.0 |
| 21 | 23 16 52.78 | -0.390 | -6 4 24.2 | -3.26 | 15 18.4 | 21 | 23 7 4.30 | -1.113 | -7 14 10.9 | -7.41 | 13 6.6 |
| 22 | 23 16 43.08 | 0.419 | 6 5 44.5 | 3.43 | 15 14.3 | 22 | 23 6 37.42 | 1.127 | 7 17 9.6 | 7.47 | 13 2.2 |
| 23 | 23 16 32.68 | 0.448 | 6 7 9.0 | 3.61 | 15 10.2 | 23 | 23 6 10.21 | 1.140 | 7 20 9.8 | 7.53 | 12 57.8 |
| 24 | 23 16 21.59 | 0.477 | 6 8 37.8 | 3.79 | 15 6.1 | 24 | 23 5 42.69 | 1.153 | 7 23 11.4 | 7.59 | 12 53.4 |
| 25 | 23 16 9.81 | 0.505 | 6 10 10.7 | 3.96 | 15 1.9 | 25 | 23 5 14.90 | 1.164 | 7 26 14.2 | 7.64 | 12 49.0 |
| 26 | 23 15 57.35 | -0.533 | -6 11 47.8 | -4.13 | 14 57.8 | 26 | 23 4 46.83 | -1.175 | -7 29 18.2 | -7.69 | 12 44.6 |
| 27 | 23 15 44.21 | 0.561 | 6 13 28.9 | 4.30 | 14 53.6 | 27 | 23 4 18.51 | 1.185 | 7 32 23.2 | 7.73 | 12 40.2 |
| 28 | 23 15 30.41 | 0.589 | 6 15 14.1 | 4.47 | 14 49.5 | 28 | 23 3 49.97 | 1.194 | 7 35 29.1 | 7.76 | 12 35.8 |
| 29 | 23 15 15.94 | 0.616 | 6 17 3.3 | 4.63 | 14 45.3 | 29 | 23 3 21.23 | 1.202 | 7 38 35.7 | 7.79 | 12 31.4 |
| 30 | 23 15 0.82 | 0.643 | 6 18 56.4 | 4.79 | 14 41.1 | 30 | 23 2 52.29 | 1.209 | 7 41 42.9 | 7.81 | 12 27.0 |
| 31 | 23 14 45.05 | -0.670 | -6 20 53.3 | -4.95 | 14 36.9 | 31 | 23 2 23.19 | -1.215 | -7 44 50.5 | -7.82 | 12 22.6 |
| 32 | 23 14 28.63 | -0.697 | -6 22 54.1 | -5.11 | 14 32.7 | 32 | 23 1 53.95 | -1.220 | -7 47 58.4 | -7.83 | 12 18.2 |
| Day of the Month. | 4th. | 12th. | 20th. | 28th. | | Day of the Month. | 5th. | 13th. | 21st. | 29th. | |
| Polar Semidiameter . . | 21".0 | 21".5 | 22".0 | 22".5 | | Polar Semidiameter . . | 22".9 | 23".2 | 23".5 | 23".7 | |
| Horizontal Parallax . . | 2.0 | 2.0 | 2.1 | 2.1 | | Horizontal Parallax . . | 2.1 | 2.2 | 2.2 | 2.2 | |

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

| SEPTEMBER. | | | | | | OCTOBER. | | | | | |
|-------------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|-------------------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m |
| 1 | 23 1 53.95 | -1.220 | -7 47 58.4 | -7.83 | 12 18.2 | 1 | 22 48 2.81 | -0.957 | -9 12 44.6 | -5.53 | 10 6.5 |
| 2 | 23 1 24.60 | 1.225 | 7 51 6.5 | 7.84 | 12 13.7 | 2 | 22 47 40.08 | 0.936 | 9 14 55.4 | 5.38 | 10 2.2 |
| 3 | 23 0 55.15 | 1.229 | 7 54 14.6 | 7.84 | 12 9.3 | 3 | 22 47 17.88 | 0.914 | 9 17 2.6 | 5.23 | 9 57.9 |
| 4 | 23 0 25.62 | 1.232 | 7 57 22.6 | 7.83 | 12 4.9 | 4 | 22 46 56.23 | 0.891 | 9 19 6.2 | 5.07 | 9 53.6 |
| 5 | 22 59 56.05 | 1.233 | 8 0 30.3 | 7.81 | 12 0.5 | 5 | 22 46 35.13 | 0.867 | 9 21 5.9 | 4.91 | 9 49.3 |
| 6 | 22 59 26.46 | -1.233 | -8 3 37.5 | -7.79 | 11 56.1 | 6 | 22 46 14.61 | -0.843 | -9 23 1.8 | -4.75 | 9 45.1 |
| 7 | 22 58 56.86 | 1.232 | 8 6 44.1 | 7.76 | 11 51.6 | 7 | 22 45 54.67 | 0.818 | 9 24 53.7 | 4.58 | 9 40.8 |
| 8 | 22 58 27.29 | 1.232 | 8 9 50.0 | 7.73 | 11 47.2 | 8 | 22 45 35.33 | 0.793 | 9 26 41.6 | 4.41 | 9 36.5 |
| 9 | 22 57 57.76 | 1.229 | 8 12 55.0 | 7.69 | 11 42.8 | 9 | 22 45 16.62 | 0.767 | 9 28 25.4 | 4.24 | 9 32.3 |
| 10 | 22 57 28.30 | 1.225 | 8 15 59.0 | 7.64 | 11 38.4 | 10 | 22 44 58.53 | 0.741 | 9 30 5.1 | 4.07 | 9 28.1 |
| 11 | 22 56 58.94 | -1.221 | -8 19 1.8 | -7.59 | 11 33.9 | 11 | 22 44 41.08 | -0.714 | -9 31 40.6 | -3.89 | 9 23.9 |
| 12 | 22 56 29.68 | 1.216 | 8 22 3.3 | 7.53 | 11 29.5 | 12 | 22 44 24.27 | 0.687 | 9 33 11.8 | 3.71 | 9 19.7 |
| 13 | 22 56 0.56 | 1.210 | 8 25 3.4 | 7.47 | 11 25.1 | 13 | 22 44 8.13 | 0.659 | 9 34 38.7 | 3.53 | 9 15.5 |
| 14 | 22 55 31.60 | 1.203 | 8 28 2.0 | 7.40 | 11 20.7 | 14 | 22 43 52.66 | 0.631 | 9 36 1.3 | 3.35 | 9 11.3 |
| 15 | 22 55 2.82 | 1.195 | 8 30 58.8 | 7.33 | 11 16.3 | 15 | 22 43 37.86 | 0.602 | 9 37 19.6 | 3.17 | 9 7.1 |
| 16 | 22 54 34.23 | -1.186 | -8 33 53.8 | -7.25 | 11 11.9 | 16 | 22 43 23.75 | -0.573 | -9 38 33.4 | -2.99 | 9 3.0 |
| 17 | 22 54 5.86 | 1.177 | 8 36 46.9 | 7.17 | 11 7.5 | 17 | 22 43 10.33 | 0.544 | 9 39 42.9 | 2.80 | 8 58.8 |
| 18 | 22 53 37.73 | 1.167 | 8 39 38.0 | 7.08 | 11 3.1 | 18 | 22 42 57.61 | 0.515 | 9 40 47.8 | 2.62 | 8 54.7 |
| 19 | 22 53 9.86 | 1.156 | 8 42 26.9 | 6.99 | 10 58.7 | 19 | 22 42 45.60 | 0.485 | 9 41 48.3 | 2.43 | 8 50.6 |
| 20 | 22 52 42.27 | 1.143 | 8 45 13.5 | 6.89 | 10 54.3 | 20 | 22 42 34.31 | 0.455 | 9 42 44.3 | 2.24 | 8 46.4 |
| 21 | 22 52 14.98 | -1.130 | -8 47 57.7 | -6.79 | 10 50.0 | 21 | 22 42 23.74 | -0.425 | -9 43 35.7 | -2.05 | 8 42.3 |
| 22 | 22 51 48.01 | 1.116 | 8 50 39.4 | 6.68 | 10 45.6 | 22 | 22 42 13.89 | 0.395 | 9 44 22.5 | 1.86 | 8 38.3 |
| 23 | 22 51 21.38 | 1.102 | 8 53 18.5 | 6.57 | 10 41.2 | 23 | 22 42 4.78 | 0.364 | 9 45 4.8 | 1.66 | 8 34.2 |
| 24 | 22 50 55.10 | 1.087 | 8 55 54.9 | 6.45 | 10 36.8 | 24 | 22 41 56.41 | 0.333 | 9 45 42.4 | 1.47 | 8 20.1 |
| 25 | 22 50 29.20 | 1.071 | 8 58 28.4 | 6.33 | 10 32.5 | 25 | 22 41 48.78 | 0.302 | 9 46 15.4 | 1.28 | 8 26.1 |
| 26 | 22 50 3.70 | -1.054 | -9 0 59.1 | -6.21 | 10 28.1 | 26 | 22 41 41.91 | -0.271 | -9 46 43.8 | -1.08 | 8 22.0 |
| 27 | 22 49 38.61 | 1.036 | 9 3 26.7 | 6.08 | 10 23.8 | 27 | 22 41 35.79 | 0.239 | 9 47 7.5 | 0.89 | 8 18.0 |
| 28 | 22 49 13.96 | 1.017 | 9 5 51.1 | 5.95 | 10 19.4 | 28 | 22 41 30.42 | 0.207 | 9 47 26.6 | 0.70 | 8 14.0 |
| 29 | 22 48 49.76 | 0.998 | 9 8 12.3 | 5.81 | 10 15.1 | 29 | 22 41 25.83 | 0.175 | 9 47 40.9 | 0.50 | 8 10.0 |
| 30 | 22 48 26.04 | 0.978 | 9 10 30.2 | 5.67 | 10 10.8 | 30 | 22 41 22.01 | 0.143 | 9 47 50.5 | 0.31 | 8 6.0 |
| 31 | 22 48 2.81 | -0.957 | -9 12 44.6 | -5.53 | 10 6.5 | 31 | 22 41 18.95 | -0.111 | -9 47 55.4 | -0.11 | 8 2.0 |
| 32 | 22 47 40.08 | -0.936 | -9 14 55.4 | -5.38 | 10 2.2 | 32 | 22 41 16.66 | -0.079 | -9 47 55.6 | +0.09 | 7 58.0 |
| Day of the Month. | | 6th. | 14th. | 22d. | 30th. | Day of the Month. | | 8th. | 16th. | 24th. | |
| Polar Semidiameter . . | | 23".7 | 23".6 | 23".4 | 23".2 | Polar Semidiameter | | 22".8 | 22".4 | 21".9 | |
| Horizontal Parallax . . | | 2.2 | 2.2 | 2.2 | 2.2 | Horizontal Parallax | | 2.1 | 2.1 | 2.1 | |

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

| NOVEMBER. | | | | | | DECEMBER. | | | | | | | |
|---------------------|---------------------------|--------------------------|-----------------------|---------------------------|-------------------|-------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|-------|-------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | | |
| | ° Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | | | |
| | h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m | | |
| 1 | 22 41 16.66 | -0.079 | -9 47 55.6 | +0.09 | 7 58.0 | 1 | 22 45 59.99 | +0.843 | -9 12 35.4 | +5.65 | 6 4.9 | | |
| 2 | 22 41 15.15 | 0.047 | 9 47 51.1 | 0.28 | 7 54.1 | 2 | 22 46 20.56 | 0.871 | 9 10 17.7 | 5.82 | 6 1.3 | | |
| 3 | 22 41 14.42 | -0.014 | 9 47 41.8 | 0.48 | 7 50.1 | 3 | 22 46 41.79 | 0.899 | 9 7 56.0 | 5.99 | 5 57.7 | | |
| 4 | 22 41 14.46 | +0.018 | 9 47 27.9 | 0.68 | 7 46.2 | 4 | 22 47 3.68 | 0.926 | 9 5 30.3 | 6.15 | 5 54.1 | | |
| 5 | 22 41 15.28 | 0.051 | 9 47 9.2 | 0.88 | 7 42.3 | 5 | 22 47 26.22 | 0.953 | 9 3 0.6 | 6.32 | 5 50.6 | | |
| 6 | 22 41 16.88 | +0.083 | -9 46 45.8 | +1.08 | 7 38.4 | 6 | 22 47 49.40 | +0.979 | -9 0 27.0 | +6.48 | 5 47.0 | | |
| 7 | 22 41 19.25 | 0.115 | 9 46 17.7 | 1.27 | 7 34.5 | 7 | 22 48 13.22 | 1.005 | 8 57 49.6 | 6.64 | 5 43.5 | | |
| 8 | 22 41 22.39 | 0.147 | 9 45 44.9 | 1.47 | 7 30.6 | 8 | 22 48 37.66 | 1.031 | 8 55 8.3 | 6.80 | 5 40.0 | | |
| 9 | 22 41 26.30 | 0.179 | 9 45 7.5 | 1.66 | 7 26.7 | 9 | 22 49 2.72 | 1.057 | 8 52 23.2 | 6.96 | 5 36.5 | | |
| 10 | 22 41 30.98 | 0.211 | 9 44 25.4 | 1.85 | 7 22.9 | 10 | 22 49 28.40 | 1.082 | 8 49 34.4 | 7.11 | 5 33.0 | | |
| 11 | 22 41 36.43 | +0.243 | -9 43 38.8 | +2.04 | 7 19.1 | 11 | 22 49 54.67 | +1.107 | -8 46 41.9 | +7.26 | 5 29.5 | | |
| 12 | 22 41 42.64 | 0.275 | 9 42 47.5 | 2.23 | 7 15.3 | 12 | 22 50 21.54 | 1.132 | 8 43 45.8 | 7.41 | 5 26.0 | | |
| 13 | 22 41 49.60 | 0.306 | 9 41 51.7 | 2.42 | 7 11.4 | 13 | 22 50 49.00 | 1.156 | 8 40 46.0 | 7.56 | 5 22.5 | | |
| 14 | 22 41 57.32 | 0.338 | 9 40 51.3 | 2.61 | 7 7.6 | 14 | 22 51 17.04 | 1.180 | 8 37 42.7 | 7.71 | 5 19.0 | | |
| 15 | 22 42 5.79 | 0.369 | 9 39 46.4 | 2.80 | 7 3.9 | 15 | 22 51 45.65 | 1.204 | 8 34 35.8 | 7.86 | 5 15.6 | | |
| 16 | 22 42 15.01 | +0.400 | -9 38 37.0 | +2.98 | 7 0.1 | 16 | 22 52 14.82 | +1.227 | -8 31 25.4 | +8.00 | 5 12.1 | | |
| 17 | 22 42 24.97 | 0.431 | 9 37 23.2 | 3.17 | 6 56.3 | 17 | 22 52 44.55 | 1.250 | 8 28 11.6 | 8.15 | 5 8.7 | | |
| 18 | 22 42 35.66 | 0.462 | 9 36 4.9 | 3.36 | 6 52.6 | 18 | 22 53 14.84 | 1.273 | 8 24 54.3 | 8.29 | 5 5.3 | | |
| 19 | 22 42 47.09 | 0.492 | 9 34 42.2 | 3.54 | 6 48.8 | 19 | 22 53 45.66 | 1.296 | 8 21 33.7 | 8.43 | 5 1.9 | | |
| 20 | 22 42 59.25 | 0.522 | 9 33 15.2 | 3.72 | 6 45.1 | 20 | 22 54 17.02 | 1.318 | 8 18 9.8 | 8.57 | 4 58.5 | | |
| 21 | 22 43 12.14 | +0.552 | -9 31 43.8 | +3.90 | 6 41.4 | 21 | 22 54 48.91 | +1.340 | -8 14 42.5 | +8.71 | 4 55.1 | | |
| 22 | 22 43 25.75 | 0.582 | 9 30 8.0 | 4.08 | 6 37.7 | 22 | 22 55 21.33 | 1.362 | 8 11 11.9 | 8.84 | 4 51.7 | | |
| 23 | 22 43 40.08 | 0.612 | 9 28 28.0 | 4.26 | 6 34.0 | 23 | 22 55 54.26 | 1.384 | 8 7 38.1 | 8.98 | 4 48.3 | | |
| 24 | 22 43 55.12 | 0.642 | 9 26 43.7 | 4.44 | 6 30.3 | 24 | 22 56 27.71 | 1.405 | 8 4 1.1 | 9.11 | 4 44.9 | | |
| 25 | 22 44 10.87 | 0.671 | 9 24 55.1 | 4.62 | 6 26.6 | 25 | 22 57 1.66 | 1.426 | 8 0 20.9 | 9.24 | 4 41.5 | | |
| 26 | 22 44 27.32 | +0.700 | -9 23 2.2 | +4.80 | 6 23.0 | 26 | 22 57 36.11 | +1.446 | -7 56 37.5 | +9.37 | 4 38.1 | | |
| 27 | 22 44 44.48 | 0.729 | 9 21 5.1 | 4.97 | 6 19.3 | 27 | 22 58 11.05 | 1.466 | 7 52 51.1 | 9.50 | 4 34.8 | | |
| 28 | 22 45 2.33 | 0.758 | 9 19 3.9 | 5.14 | 6 15.7 | 28 | 22 58 46.47 | 1.486 | 7 49 1.6 | 9.62 | 4 31.4 | | |
| 29 | 22 45 20.86 | 0.787 | 9 16 58.5 | 5.31 | 6 12.1 | 29 | 22 59 22.37 | 1.506 | 7 45 9.1 | 9.75 | 4 28.1 | | |
| 30 | 22 45 40.09 | 0.815 | 9 14 49.0 | 5.48 | 6 8.5 | 30 | 22 59 58.73 | 1.525 | 7 41 13.6 | 9.88 | 4 24.8 | | |
| 31 | 22 45 59.99 | +0.843 | -9 12 35.4 | +5.65 | 6 4.9 | 31 | 23 0 35.56 | +1.544 | -7 37 15.1 | +10.00 | 4 21.5 | | |
| 32 | 22 46 20.56 | +0.871 | -9 10 17.7 | +5.82 | 6 1.3 | 32 | 23 1 12.84 | +1.563 | -7 33 13.7 | +10.19 | 4 18.2 | | |
| Day of the Month. | | | | | | Day of the Month. | | | | | | | |
| | | | 1st. | 9th. | 17th. | 25th. | | | 2d. | 11th. | 19th. | 27th. | 35th. |
| Polar Semidiameter | | | 21".4 | 20".8 | 20".3 | 19".8 | Polar Semidiameter | | 19".3 | 18".8 | 18".3 | 17".9 | 17".5 |
| Horizontal Parallax | | | 2.0 | 2.0 | 1.9 | 1.9 | Horizontal Parallax | | 1.8 | 1.8 | 1.7 | 1.7 | 1.6 |

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

| JANUARY. | | | | | | FEBRUARY. | | | | | |
|-------------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|-------------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| Noon. | Noon. | Noon. | Noon. | Noon. | | Noon. | Noon. | Noon. | Noon. | Noon. | |
| <small>h m s</small> | <small>s</small> | <small>° ' "</small> | <small>h m</small> | <small>h m</small> | | <small>h m s</small> | <small>s</small> | <small>° ' "</small> | <small>h m</small> | <small>h m</small> | |
| 1 | 11 15 52.40 | -0.065 | +6 53 10.8 | +1.14 | 16 29.7 | 1 | 11 11 59.24 | -0.536 | +7 25 52.7 | +3.92 | 14 23.9 |
| 2 | 11 15 50.64 | 0.082 | 6 53 39.4 | 1.24 | 16 25.8 | 2 | 11 11 46.25 | 0.548 | 7 27 27.6 | 3.99 | 14 19.7 |
| 3 | 11 15 48.48 | 0.099 | 6 54 10.5 | 1.35 | 16 21.8 | 3 | 11 11 32.97 | 0.559 | 7 29 4.1 | 4.05 | 14 15.6 |
| 4 | 11 15 45.91 | 0.116 | 6 54 44.1 | 1.46 | 16 17.8 | 4 | 11 11 19.41 | 0.570 | 7 30 42.0 | 4.11 | 14 11.4 |
| 5 | 11 15 42.93 | 0.133 | 6 55 20.3 | 1.56 | 16 13.8 | 5 | 11 11 5.57 | 0.581 | 7 32 21.4 | 4.17 | 14 7.3 |
| 6 | 11 15 39.53 | -0.150 | +6 55 58.9 | +1.66 | 16 9.8 | 6 | 11 10 51.48 | -0.592 | +7 34 2.1 | +4.23 | 14 3.1 |
| 7 | 11 15 35.74 | 0.166 | 6 56 40.0 | 1.76 | 16 5.8 | 7 | 11 10 37.13 | 0.603 | 7 35 44.2 | 4.26 | 13 58.9 |
| 8 | 11 15 31.54 | 0.183 | 6 57 23.5 | 1.86 | 16 1.8 | 8 | 11 10 22.54 | 0.613 | 7 37 27.5 | 4.33 | 13 54.7 |
| 9 | 11 15 26.95 | 0.200 | 6 58 9.5 | 1.96 | 15 57.8 | 9 | 11 10 7.71 | 0.623 | 7 39 12.0 | 4.36 | 13 50.6 |
| 10 | 11 15 21.96 | 0.217 | 6 58 57.9 | 2.06 | 15 53.8 | 10 | 11 9 52.65 | 0.632 | 7 40 57.7 | 4.43 | 13 46.4 |
| 11 | 11 15 16.57 | -0.233 | +6 59 48.8 | +2.16 | 15 49.8 | 11 | 11 9 37.37 | -0.641 | +7 42 44.5 | +4.47 | 13 42.2 |
| 12 | 11 15 10.80 | 0.249 | 7 0 42.0 | 2.26 | 15 45.8 | 12 | 11 9 21.88 | 0.650 | 7 44 32.2 | 4.51 | 13 38.0 |
| 13 | 11 15 4.63 | 0.265 | 7 1 37.5 | 2.36 | 15 41.7 | 13 | 11 9 6.19 | 0.658 | 7 46 21.0 | 4.55 | 13 33.8 |
| 14 | 11 14 58.07 | 0.281 | 7 2 35.4 | 2.46 | 15 37.7 | 14 | 11 8 50.31 | 0.666 | 7 48 10.6 | 4.59 | 13 29.6 |
| 15 | 11 14 51.13 | 0.297 | 7 3 35.5 | 2.56 | 15 33.6 | 15 | 11 8 34.24 | 0.673 | 7 50 1.2 | 4.62 | 13 25.4 |
| 16 | 11 14 43.82 | -0.313 | +7 4 37.9 | +2.65 | 15 29.6 | 16 | 11 8 18.00 | -0.680 | +7 51 52.4 | +4.65 | 13 21.2 |
| 17 | 11 14 36.14 | 0.298 | 7 5 42.5 | 2.74 | 15 25.5 | 17 | 11 8 1.59 | 0.687 | 7 53 44.3 | 4.68 | 13 17.0 |
| 18 | 11 14 28.08 | 0.243 | 7 6 49.3 | 2.83 | 15 21.4 | 18 | 11 7 45.03 | 0.693 | 7 55 36.9 | 4.70 | 13 12.8 |
| 19 | 11 14 19.66 | 0.258 | 7 7 58.3 | 2.92 | 15 17.4 | 19 | 11 7 28.32 | 0.699 | 7 57 30.0 | 4.72 | 13 8.6 |
| 20 | 11 14 10.88 | 0.273 | 7 9 9.3 | 3.01 | 15 13.3 | 20 | 11 7 11.47 | 0.705 | 7 59 23.7 | 4.74 | 13 4.4 |
| 21 | 11 14 1.75 | -0.288 | +7 10 22.5 | +3.09 | 15 9.2 | 21 | 11 6 54.49 | -0.710 | +8 1 17.8 | +4.76 | 13 0.2 |
| 22 | 11 13 52.26 | 0.292 | 7 11 37.7 | 3.17 | 15 5.1 | 22 | 11 6 37.40 | 0.715 | 8 3 12.3 | 4.77 | 12 56.0 |
| 23 | 11 13 42.43 | 0.216 | 7 12 54.8 | 3.25 | 15 1.0 | 23 | 11 6 20.20 | 0.719 | 8 5 7.1 | 4.78 | 12 51.7 |
| 24 | 11 13 32.26 | 0.230 | 7 14 13.9 | 3.33 | 14 56.9 | 24 | 11 6 2.69 | 0.723 | 8 7 2.2 | 4.79 | 12 47.5 |
| 25 | 11 13 21.76 | 0.244 | 7 15 35.0 | 3.41 | 14 52.8 | 25 | 11 5 45.49 | 0.727 | 8 8 57.5 | 4.80 | 12 43.3 |
| 26 | 11 13 10.92 | -0.258 | +7 16 57.9 | +3.49 | 14 48.7 | 26 | 11 5 28.01 | -0.730 | +8 10 53.0 | +4.81 | 12 39.1 |
| 27 | 11 12 59.75 | 0.272 | 7 18 22.7 | 3.57 | 14 44.6 | 27 | 11 5 10.46 | 0.733 | 8 12 48.5 | 4.81 | 12 34.8 |
| 28 | 11 12 48.27 | 0.285 | 7 19 49.3 | 3.64 | 14 40.4 | 28 | 11 4 52.84 | 0.735 | 8 14 44.1 | 4.81 | 12 30.6 |
| 29 | 11 12 36.47 | 0.298 | 7 21 17.6 | 3.71 | 14 36.3 | 29 | 11 4 35.17 | 0.737 | 8 16 39.7 | 4.81 | 12 26.4 |
| 30 | 11 12 24.36 | 0.311 | 7 22 47.6 | 3.78 | 14 32.2 | 30 | 11 4 17.46 | 0.739 | 8 18 35.1 | 4.81 | 12 22.2 |
| 31 | 11 12 11.95 | -0.324 | +7 24 19.4 | +3.85 | 14 28.0 | 31 | 11 3 59.71 | -0.740 | +8 20 30.4 | +4.80 | 12 18.0 |
| 32 | 11 11 59.24 | -0.336 | +7 25 52.7 | +3.92 | 14 23.9 | 32 | 11 3 41.94 | -0.741 | +8 22 25.5 | +4.79 | 12 13.7 |
| Day of the Month. | | 1st. | 9th. | 7th. | 25th. | Day of the Month. | | 2d. | 10th. | 18th. | 26th. |
| Polar Semidiameter . . | | 8".8 | 8".9 | 9".0 | 9".1 | Polar Semidiameter . . | | 9".2 | 9".3 | 9".3 | 9".3 |
| Horizontal Parallax . . | | 1.0 | 1.0 | 1.0 | 1.0 | Horizontal Parallax . . | | 1.0 | 1.0 | 1.1 | 1.1 |

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

| MAY. | | | | | | JUNE. | | | | | |
|-------------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------------|-------------------|---------------------------|---------------------------|-----------------------|---------------------------|-------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| | h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m |
| 1 | 10 50 59.89 | -0.193 | +9 37 1.1 | +0.79 | 8 13.1 | 1 | 10 51 43.36 | +0.306 | +9 27 17.6 | -2.30 | 6 12.0 |
| 2 | 10 50 55.46 | 0.177 | 9 37 18.5 | 0.69 | 8 9.1 | 2 | 10 51 50.79 | 0.399 | 9 26 21.4 | 2.30 | 6 8.2 |
| 3 | 10 50 51.41 | 0.161 | 9 37 33.5 | 0.59 | 8 5.1 | 3 | 10 51 58.68 | 0.337 | 9 25 22.9 | 2.48 | 6 4.4 |
| 4 | 10 50 47.75 | 0.145 | 9 37 46.0 | 0.49 | 8 1.1 | 4 | 10 52 6.94 | 0.352 | 9 24 22.3 | 2.57 | 6 0.6 |
| 5 | 10 50 44.49 | 0.129 | 9 37 56.1 | 0.38 | 7 57.1 | 5 | 10 52 15.56 | 0.367 | 9 23 19.3 | 2.66 | 5 56.8 |
| 6 | 10 50 41.60 | -0.113 | +9 38 3.8 | +0.28 | 7 53.2 | 6 | 10 52 24.55 | +0.392 | +9 22 14.3 | -2.75 | 5 53.1 |
| 7 | 10 50 39.10 | 0.096 | 9 38 9.0 | 0.17 | 7 49.2 | 7 | 10 52 33.91 | 0.397 | 9 21 7.1 | 2.84 | 5 49.3 |
| 8 | 10 50 36.99 | 0.080 | 9 38 11.8 | +0.07 | 7 45.2 | 8 | 10 52 43.61 | 0.413 | 9 19 57.7 | 2.93 | 5 45.5 |
| 9 | 10 50 35.27 | 0.063 | 9 38 12.1 | -0.04 | 7 41.3 | 9 | 10 52 53.67 | 0.427 | 9 18 46.3 | 3.02 | 5 41.7 |
| 10 | 10 50 33.95 | 0.047 | 9 38 10.0 | 0.14 | 7 37.3 | 10 | 10 53 4.09 | 0.442 | 9 17 32.6 | 3.11 | 5 38.0 |
| 11 | 10 50 33.02 | -0.030 | +9 38 5.4 | -0.24 | 7 33.4 | 11 | 10 53 14.86 | +0.456 | +9 16 16.9 | -3.20 | 5 34.2 |
| 12 | 10 50 32.49 | -0.014 | 9 37 58.4 | 0.34 | 7 29.5 | 12 | 10 53 25.97 | 0.470 | 9 14 59.1 | 3.29 | 5 30.5 |
| 13 | 10 50 32.34 | +0.003 | 9 37 49.0 | 0.45 | 7 25.5 | 13 | 10 53 37.42 | 0.484 | 9 13 39.3 | 3.38 | 5 26.7 |
| 14 | 10 50 32.59 | 0.090 | 9 37 37.1 | 0.55 | 7 21.6 | 14 | 10 53 49.22 | 0.498 | 9 12 17.4 | 3.46 | 5 23.0 |
| 15 | 10 50 33.24 | 0.036 | 9 37 22.7 | 0.65 | 7 17.7 | 15 | 10 54 1.36 | 0.512 | 9 10 53.5 | 3.54 | 5 19.2 |
| 16 | 10 50 34.27 | +0.052 | +9 37 5.9 | -0.75 | 7 13.8 | 16 | 10 54 13.82 | +0.526 | +9 9 27.7 | -3.69 | 5 15.5 |
| 17 | 10 50 35.69 | 0.068 | 9 36 46.7 | 0.85 | 7 9.8 | 17 | 10 54 26.61 | 0.540 | 9 7 59.8 | 3.70 | 5 11.8 |
| 18 | 10 50 37.52 | 0.064 | 9 36 25.2 | 0.95 | 7 5.9 | 18 | 10 54 39.74 | 0.554 | 9 6 30.0 | 3.78 | 5 8.1 |
| 19 | 10 50 39.73 | 0.100 | 9 36 1.2 | 1.05 | 7 2.1 | 19 | 10 54 53.18 | 0.567 | 9 4 58.3 | 3.86 | 5 4.4 |
| 20 | 10 50 42.32 | 0.116 | 9 35 34.9 | 1.15 | 6 58.2 | 20 | 10 55 6.94 | 0.580 | 9 3 24.7 | 3.94 | 5 0.7 |
| 21 | 10 50 45.30 | +0.132 | +9 35 6.2 | -1.25 | 6 54.3 | 21 | 10 55 21.02 | +0.593 | +9 1 49.2 | -4.02 | 4 57.0 |
| 22 | 10 50 48.67 | 0.148 | 9 34 35.1 | 1.34 | 6 50.4 | 22 | 10 55 35.41 | 0.606 | 9 0 11.8 | 4.10 | 4 53.3 |
| 23 | 10 50 52.42 | 0.164 | 9 34 1.8 | 1.44 | 6 46.5 | 23 | 10 55 50.12 | 0.619 | 8 58 32.6 | 4.18 | 4 49.6 |
| 24 | 10 50 56.55 | 0.180 | 9 33 26.1 | 1.54 | 6 42.7 | 24 | 10 56 5.13 | 0.632 | 8 56 51.6 | 4.26 | 4 45.9 |
| 25 | 10 51 1.07 | 0.196 | 9 32 48.0 | 1.63 | 6 38.8 | 25 | 10 56 20.45 | 0.645 | 8 55 8.6 | 4.33 | 4 42.2 |
| 26 | 10 51 5.96 | +0.212 | +9 32 7.6 | -1.73 | 6 35.0 | 26 | 10 56 36.06 | +0.657 | +8 53 23.9 | -4.40 | 4 38.6 |
| 27 | 10 51 11.24 | 0.228 | 9 31 25.0 | 1.82 | 6 31.2 | 27 | 10 56 51.98 | 0.669 | 8 51 37.5 | 4.48 | 4 34.9 |
| 28 | 10 51 16.89 | 0.244 | 9 30 40.1 | 1.92 | 6 27.3 | 28 | 10 57 8.19 | 0.681 | 8 49 49.3 | 4.55 | 4 31.3 |
| 29 | 10 51 22.92 | 0.260 | 9 29 52.8 | 2.02 | 6 23.5 | 29 | 10 57 24.69 | 0.693 | 8 47 59.4 | 4.62 | 4 27.6 |
| 30 | 10 51 29.33 | 0.276 | 9 29 3.3 | 2.11 | 6 19.7 | 30 | 10 57 41.48 | 0.705 | 8 46 7.7 | 4.69 | 4 24.0 |
| 31 | 10 51 36.11 | +0.291 | +9 28 11.6 | -2.21 | 6 15.8 | 31 | 10 57 58.57 | +0.717 | +8 44 14.3 | -4.76 | 4 20.3 |
| 32 | 10 51 43.26 | +0.306 | +9 27 17.6 | -2.30 | 6 12.0 | 32 | 10 58 15.92 | +0.729 | +8 42 19.3 | -4.83 | 4 16.7 |
| Day of the Month. | | | | | | Day of the Month. | | | | | |
| | 1st. | 9th. | 17th. | 25th. | | | 2d. | 10th. | 18th. | 26th. | |
| Polar Semidiameter . . | 8'9 | 8'7 | 8'6 | 8'5 | Polar Semidiameter . . | 8'4 | 8'2 | 8'1 | 8'0 | | |
| Horizontal Parallax . . | 1.0 | 1.0 | 1.0 | 1.0 | Horizontal Parallax . . | 0.9 | 0.9 | 0.9 | 0.9 | | |

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

| JULY. | | | | | | AUGUST. | | | | | |
|-------------------------|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|-------------------------|---------------------------------|------------------------------------|--------------------------|------------------------------------|----------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| Noon. | Noon. | Noon. | Noon. | Noon. | | Noon. | Noon. | Noon. | Noon. | | |
| h m s | s | ° ' " | " | h m | | h m s | s | ° ' " | " | h m | |
| 1 | 10 57 58.57 | +0.717 | +8 44 14.3 | -4.76 | 4 20.3 | 1 | 11 8 49.56 | +1.009 | +7 33 37.2 | -6.48 | 2 29.2 |
| 2 | 10 58 15.92 | 0.729 | 8 42 19.3 | 4.83 | 4 16.7 | 2 | 11 9 13.83 | 1.016 | 7 31 1.2 | 6.52 | 2 25.6 |
| 3 | 10 58 33.56 | 0.741 | 8 40 22.6 | 4.90 | 4 13.0 | 3 | 11 9 38.26 | 1.022 | 7 28 24.3 | 6.56 | 2 22.1 |
| 4 | 10 58 51.48 | 0.752 | 8 38 24.3 | 4.97 | 4 9.4 | 4 | 11 10 2.84 | 1.028 | 7 25 46.4 | 6.60 | 2 18.6 |
| 5 | 10 59 9.67 | 0.763 | 8 36 24.3 | 5.04 | 4 5.7 | 5 | 11 10 27.58 | 1.034 | 7 23 7.5 | 6.64 | 2 15.1 |
| 6 | 10 59 28.12 | +0.774 | +8 34 22.8 | -5.10 | 4 2.1 | 6 | 11 10 52.48 | +1.040 | +7 20 27.8 | -6.68 | 2 11.6 |
| 7 | 10 59 46.84 | 0.785 | 8 32 19.7 | 5.17 | 3 58.5 | 7 | 11 11 17.52 | 1.046 | 7 17 47.2 | 6.72 | 2 8.1 |
| 8 | 11 0 5.83 | 0.796 | 8 30 14.9 | 5.24 | 3 54.9 | 8 | 11 11 42.70 | 1.052 | 7 15 5.8 | 6.75 | 2 4.6 |
| 9 | 11 0 25.08 | 0.807 | 8 28 8.7 | 5.30 | 3 51.3 | 9 | 11 12 8.03 | 1.058 | 7 12 23.4 | 6.78 | 2 1.1 |
| 10 | 11 0 44.57 | 0.818 | 8 26 1.0 | 5.36 | 3 47.7 | 10 | 11 12 33.50 | 1.063 | 7 9 40.4 | 6.81 | 1 57.6 |
| 11 | 11 1 4.31 | +0.828 | +8 23 51.8 | -5.42 | 3 44.1 | 11 | 11 12 59.08 | +1.068 | +7 6 56.7 | -6.84 | 1 54.1 |
| 12 | 11 1 24.30 | 0.838 | 8 21 41.0 | 5.48 | 3 40.5 | 12 | 11 13 24.80 | 1.073 | 7 4 12.2 | 6.87 | 1 50.6 |
| 13 | 11 1 44.53 | 0.848 | 8 19 28.9 | 5.54 | 3 36.9 | 13 | 11 13 50.63 | 1.078 | 7 1 27.0 | 6.90 | 1 47.1 |
| 14 | 11 2 4.99 | 0.858 | 8 17 15.3 | 5.60 | 3 33.3 | 14 | 11 14 16.58 | 1.083 | 6 58 41.1 | 6.93 | 1 43.6 |
| 15 | 11 2 25.69 | 0.868 | 8 15 0.4 | 5.66 | 3 29.7 | 15 | 11 14 42.65 | 1.088 | 6 55 54.5 | 6.95 | 1 40.1 |
| 16 | 11 2 46.62 | +0.877 | +8 12 44.1 | -5.71 | 3 26.1 | 16 | 11 15 8.83 | +1.093 | +6 53 7.4 | -6.98 | 1 36.6 |
| 17 | 11 3 7.78 | 0.886 | 8 10 26.5 | 5.77 | 3 22.5 | 17 | 11 15 35.13 | 1.098 | 6 50 19.6 | 7.01 | 1 33.1 |
| 18 | 11 3 29.15 | 0.895 | 8 8 7.6 | 5.82 | 3 18.9 | 18 | 11 16 1.52 | 1.102 | 6 47 31.2 | 7.03 | 1 29.6 |
| 19 | 11 3 50.74 | 0.904 | 8 5 47.4 | 5.87 | 3 15.3 | 19 | 11 16 28.01 | 1.106 | 6 44 42.3 | 7.05 | 1 26.1 |
| 20 | 11 4 12.54 | 0.913 | 8 3 25.9 | 5.92 | 3 11.8 | 20 | 11 16 54.60 | 1.110 | 6 41 52.9 | 7.07 | 1 22.6 |
| 21 | 11 4 34.56 | +0.921 | +8 1 3.2 | -5.97 | 3 8.2 | 21 | 11 17 21.28 | +1.114 | +6 39 2.9 | -7.09 | 1 19.1 |
| 22 | 11 4 56.77 | 0.930 | 7 58 39.3 | 6.02 | 3 4.7 | 22 | 11 17 48.05 | 1.118 | 6 36 12.4 | 7.11 | 1 15.6 |
| 23 | 11 5 19.19 | 0.939 | 7 56 14.1 | 6.07 | 3 1.1 | 23 | 11 18 14.91 | 1.121 | 6 33 21.5 | 7.13 | 1 12.1 |
| 24 | 11 5 41.81 | 0.947 | 7 53 47.8 | 6.12 | 2 57.6 | 24 | 11 18 41.85 | 1.124 | 6 30 30.1 | 7.15 | 1 8.6 |
| 25 | 11 6 4.64 | 0.955 | 7 51 20.4 | 6.17 | 2 54.0 | 25 | 11 19 8.87 | 1.127 | 6 27 38.3 | 7.17 | 1 5.1 |
| 26 | 11 6 27.65 | +0.963 | +7 48 51.8 | -6.22 | 2 50.5 | 26 | 11 19 35.96 | +1.130 | +6 24 46.1 | -7.19 | 1 1.6 |
| 27 | 11 6 50.85 | 0.971 | 7 46 21.9 | 6.27 | 2 46.9 | 27 | 11 20 3.13 | 1.133 | 6 21 53.6 | 7.21 | 0 58.2 |
| 28 | 11 7 14.23 | 0.979 | 7 43 51.1 | 6.32 | 2 43.4 | 28 | 11 20 30.36 | 1.136 | 6 19 0.6 | 7.22 | 0 54.7 |
| 29 | 11 7 37.80 | 0.987 | 7 41 19.2 | 6.36 | 2 39.8 | 29 | 11 20 57.66 | 1.139 | 6 16 7.4 | 7.23 | 0 51.2 |
| 30 | 11 8 1.54 | 0.995 | 7 38 46.2 | 6.40 | 2 36.3 | 30 | 11 21 25.02 | 1.141 | 6 13 13.8 | 7.24 | 0 47.7 |
| 31 | 11 8 25.46 | +1.002 | +7 36 12.2 | -6.44 | 2 32.7 | 31 | 11 21 52.44 | +1.143 | +6 10 19.9 | -7.25 | 0 44.2 |
| 32 | 11 8 49.56 | +1.009 | +7 33 37.2 | -6.48 | 2 29.2 | 32 | 11 22 19.91 | +1.145 | +6 7 25.8 | -7.26 | 0 40.8 |
| Day of the Month. | | | | | | Day of the Month. | | | | | |
| 4th. | | | | | | 5th. | | | | | |
| 12th. | | | | | | 13th. | | | | | |
| 20th. | | | | | | 21st. | | | | | |
| 28th. | | | | | | 29th. | | | | | |
| Polar Semidiameter . . | | | | | | Polar Semidiameter . . | | | | | |
| Horizontal Parallax . . | | | | | | Horizontal Parallax . . | | | | | |
| 7".9 | | | | | | 7".6 | | | | | |
| 7".8 | | | | | | 7".6 | | | | | |
| 7".8 | | | | | | 7".5 | | | | | |
| 7".7 | | | | | | 7".5 | | | | | |
| 0.9 | | | | | | 0.9 | | | | | |
| 0.9 | | | | | | 0.9 | | | | | |
| 0.9 | | | | | | 0.9 | | | | | |
| 0.9 | | | | | | 0.9 | | | | | |

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

| NOVEMBER. | | | | | | DECEMBER. | | | | | |
|---------------|--|---------------------------|--|---------------------------|-------------------|---------------|--|---------------------------|--|---------------------------|-------------------|
| Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. | Day of Month. | Apparent Right Ascension. | Var. of R. A. for 1 Hour. | Apparent Declination. | Var. of Decl. for 1 Hour. | Meridian Passage. |
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| | ^h ^m ^s | ^s | [°] ['] ["] | ["] | | | ^h ^m ^s | ^s | [°] ['] ["] | ["] | |
| 1 | 11 49 15.82 | +0.958 | +3 20 18.9 | -5.73 | 21 4.3 | 1 | 11 58 56.22 | +0.630 | +2 24 27.8 | -3.49 | 19 15.8 |
| 2 | 11 49 38.70 | 0.949 | 3 18 2.1 | 5.67 | 21 0 7 | 2 | 11 59 11.17 | 0.617 | 2 23 6.9 | 3.33 | 19 12.1 |
| 3 | 11 50 1.37 | 0.940 | 3 15 46.7 | 5.61 | 20 57.1 | 3 | 11 59 25.80 | 0.603 | 2 21 48.1 | 3.23 | 19 8.4 |
| 4 | 11 50 23.83 | 0.931 | 3 13 32.9 | 5.55 | 20 53.5 | 4 | 11 59 40.10 | 0.589 | 2 20 31.7 | 3.14 | 19 4.7 |
| 5 | 11 50 46.08 | 0.922 | 3 11 20.6 | 5.49 | 20 50.0 | 5 | 11 59 54.06 | 0.575 | 2 19 17.6 | 3.05 | 19 1.0 |
| 6 | 11 51 8.10 | +0.913 | +3 9 9.9 | -5.49 | 20 46.4 | 6 | 12 0 7.68 | +0.561 | +2 18 5.8 | -2.95 | 18 57.3 |
| 7 | 11 51 29.90 | 0.904 | 3 7 0.9 | 5.35 | 20 42.8 | 7 | 12 0 20.97 | 0.547 | 2 16 56.3 | 2.85 | 18 53.5 |
| 8 | 11 51 51.48 | 0.894 | 3 4 53.4 | 5.28 | 20 39.2 | 8 | 12 0 33.90 | 0.532 | 2 15 49.2 | 2.75 | 18 49.8 |
| 9 | 11 52 12.83 | 0.885 | 3 2 47.6 | 5.21 | 20 35.7 | 9 | 12 0 46.49 | 0.518 | 2 14 44.5 | 2.65 | 18 46.1 |
| 10 | 11 52 33.94 | 0.875 | 3 0 43.4 | 5.14 | 20 32.1 | 10 | 12 0 58.73 | 0.503 | 2 13 42.1 | 2.55 | 18 42.3 |
| 11 | 11 52 54.82 | +0.865 | +2 58 41.0 | -5.07 | 20 28.5 | 11 | 12 1 10.63 | +0.488 | +2 12 42.1 | -2.45 | 18 38.6 |
| 12 | 11 53 15.45 | 0.855 | 2 56 40.3 | 5.00 | 20 24.9 | 12 | 12 1 22.17 | 0.473 | 2 11 44.5 | 2.35 | 18 34.9 |
| 13 | 11 53 35.84 | 0.845 | 2 54 41.4 | 4.92 | 20 21.3 | 13 | 12 1 33.35 | 0.458 | 2 10 49.3 | 2.25 | 18 31.1 |
| 14 | 11 53 55.97 | 0.834 | 2 52 44.2 | 4.85 | 20 17.7 | 14 | 12 1 44.17 | 0.443 | 2 9 56.6 | 2.15 | 18 27.4 |
| 15 | 11 54 15.85 | 0.823 | 2 50 48.8 | 4.77 | 20 14.1 | 15 | 12 1 54.63 | 0.428 | 2 9 6.3 | 2.05 | 18 23.6 |
| 16 | 11 54 35.47 | +0.812 | +2 48 55.3 | -4.69 | 20 10.5 | 16 | 12 2 4.73 | +0.413 | +2 8 18.5 | -1.95 | 18 19.8 |
| 17 | 11 54 54.84 | 0.801 | 2 47 3.6 | 4.61 | 20 6.9 | 17 | 12 2 14.45 | 0.398 | 2 7 33.2 | 1.84 | 18 16.1 |
| 18 | 11 55 13.94 | 0.790 | 2 45 13.8 | 4.53 | 20 3.3 | 18 | 12 2 23.80 | 0.382 | 2 6 50.3 | 1.73 | 18 12.3 |
| 19 | 11 55 32.77 | 0.779 | 2 43 25.9 | 4.45 | 19 59.7 | 19 | 12 2 32.78 | 0.367 | 2 6 9.9 | 1.63 | 18 8.5 |
| 20 | 11 55 51.33 | 0.768 | 2 41 39.8 | 4.37 | 19 56.0 | 20 | 12 2 41.39 | 0.351 | 2 5 32.1 | 1.53 | 18 4.7 |
| 21 | 11 56 9.61 | +0.756 | +2 39 55.7 | -4.29 | 19 52.4 | 21 | 12 2 49.62 | +0.335 | +2 4 56.8 | -1.49 | 18 0.9 |
| 22 | 11 56 27.61 | 0.744 | 2 38 13.7 | 4.21 | 19 48.7 | 22 | 12 2 57.46 | 0.319 | 2 4 24.1 | 1.31 | 17 57.1 |
| 23 | 11 56 45.32 | 0.732 | 2 36 33.6 | 4.13 | 19 45.1 | 23 | 12 3 4.93 | 0.303 | 2 3 53.9 | 1.20 | 17 53.3 |
| 24 | 11 57 2.74 | 0.720 | 2 34 55.5 | 4.05 | 19 41.4 | 24 | 12 3 12.01 | 0.287 | 2 3 26.2 | 1.10 | 17 49.4 |
| 25 | 11 57 19.87 | 0.708 | 2 33 19.4 | 3.96 | 19 37.8 | 25 | 12 3 18.70 | 0.271 | 2 3 1.2 | 0.99 | 17 45.6 |
| 26 | 11 57 36.71 | +0.695 | +2 31 45.5 | -3.87 | 19 34.1 | 26 | 12 3 25.00 | +0.255 | +2 2 38.7 | -0.88 | 17 41.8 |
| 27 | 11 57 53.23 | 0.682 | 2 30 13.6 | 3.78 | 19 30.5 | 27 | 12 3 30.90 | 0.239 | 2 2 18.8 | 0.77 | 17 38.0 |
| 28 | 11 58 9.45 | 0.669 | 2 28 43.9 | 3.69 | 19 26.8 | 28 | 12 3 36.42 | 0.222 | 2 2 1.5 | 0.66 | 17 34.1 |
| 29 | 11 58 25.37 | 0.656 | 2 27 16.3 | 3.60 | 19 23.1 | 29 | 12 3 41.54 | 0.206 | 2 1 46.9 | 0.56 | 17 30.3 |
| 30 | 11 58 40.95 | 0.643 | 2 25 50.9 | 3.51 | 19 19.4 | 30 | 12 3 46.25 | 0.189 | 2 1 34.9 | 0.45 | 17 26.4 |
| 31 | 11 58 56.22 | +0.630 | +2 24 27.8 | -3.49 | 19 15.8 | 31 | 12 3 50.57 | +0.172 | +2 1 25.5 | -0.34 | 17 22.5 |
| 32 | 11 59 11.17 | +0.617 | +2 23 6.9 | -3.33 | 19 12.1 | 32 | 12 3 54.49 | +0.155 | +2 1 18.7 | -0.23 | 17 18.7 |

| Day of the Month. | 1st. | 9th. | 17th. | 25th. | Day of the Month. | 3d. | 11th. | 19th. | 27th. | 35th. |
|-------------------------|------|------|-------|-------|-------------------------|------|-------|-------|-------|-------|
| Polar Semidiameter . . | 7".7 | 7".8 | 7".9 | 8".0 | Polar Semidiameter . . | 8".1 | 8".2 | 8".3 | 8".4 | 8".5 |
| Horizontal Parallax . . | 0.9 | 0.9 | 0.9 | 0.9 | Horizontal Parallax . . | 0.9 | 0.9 | 0.9 | 1.0 | 1.0 |

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign - indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

| Month and Day. | Apparent Right Ascension. | Var. of R. A. for 1 Day. | Apparent Declination. | Var. of Decl. for 1 Day. | Meridian Passage. | Month and Day. | Apparent Right Ascension. | Var. of R. A. for 1 Day. | Apparent Declination. | Var. of Decl. for 1 Day. | Meridian Passage. |
|----------------|---------------------------|--------------------------|-----------------------|--------------------------|-------------------|----------------|---------------------------|--------------------------|-----------------------|--------------------------|-------------------|
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| Jan. 1 | h m s | s | ° ' " | " | h m | July 4 | h m s | s | ° ' " | " | h m |
| 5 | 13 55 44.29 | +7.102 | -11 16 35.0 | -37.50 | 19 9.3 | 8 | 13 42 7.20 | -0.305 | -10 0 56.5 | -0.58 | 6 52.1 |
| 9 | 13 56 11.18 | 6.337 | 11 18 56.5 | 33.23 | 18 54.0 | 12 | 13 42 7.57 | +0.493 | 10 1 8.0 | 5.14 | 6 36.4 |
| 13 | 13 56 34.96 | 5.544 | 11 21 0.5 | 28.81 | 18 38.7 | 16 | 13 42 11.15 | 1.233 | 10 1 37.7 | 9.71 | 6 20.8 |
| 17 | 13 56 55.51 | 4.798 | 11 22 46.8 | 94.29 | 18 23.3 | 20 | 13 42 17.92 | 2.089 | 10 2 25.6 | 14.23 | 6 5.2 |
| 21 | 13 57 12.76 | 3.895 | 11 24 14.8 | 19.71 | 18 7.8 | 24 | 13 42 27.85 | 2.878 | 10 3 31.4 | 18.88 | 5 49.6 |
| 25 | 13 57 26.65 | +3.053 | -11 25 24.4 | -15.10 | 17 52.3 | 28 | 13 42 40.93 | +3.658 | -10 4 54.9 | -23.07 | 5 34.1 |
| 29 | 13 57 37.17 | 2.304 | 11 26 15.6 | 10.48 | 17 36.7 | Aug. 1 | 13 42 57.10 | 4.439 | 10 6 35.9 | 27.40 | 5 18.6 |
| Feb. 2 | 13 57 44.28 | 1.350 | 11 26 48.2 | 5.83 | 17 21.1 | 5 | 13 43 16.34 | 5.191 | 10 8 34.0 | 31.66 | 5 3.2 |
| 6 | 13 57 47.97 | +0.491 | 11 27 2.3 | -1.19 | 17 5.4 | 9 | 13 43 38.61 | 5.939 | 10 10 49.1 | 35.83 | 4 47.9 |
| 10 | 13 57 48.22 | -0.367 | 11 26 57.8 | +3.45 | 16 49.7 | 13 | 13 44 3.84 | 6.667 | 10 13 20.5 | 39.86 | 4 32.6 |
| 14 | 13 57 45.05 | -1.916 | -11 26 34.8 | +8.04 | 16 33.9 | 17 | 13 44 31.92 | +7.370 | -10 16 7.8 | -43.74 | 4 17.3 |
| 18 | 13 57 38.51 | 2.050 | 11 25 53.6 | 12.52 | 16 18.0 | 21 | 13 45 2.77 | 8.048 | 10 19 10.2 | 47.43 | 4 2.1 |
| 22 | 13 57 28.68 | 2.861 | 11 24 54.7 | 16.90 | 16 2.1 | 25 | 13 45 36.27 | 8.699 | 10 22 27.0 | 50.95 | 3 46.9 |
| 26 | 13 57 15.65 | 3.645 | 11 23 38.6 | 31.11 | 15 46.2 | 29 | 13 46 12.33 | 9.396 | 10 25 57.6 | 54.32 | 3 31.8 |
| Mar. 2 | 13 56 59.55 | 4.402 | 11 22 6.0 | 25.16 | 15 30.2 | 3 | 13 46 50.84 | 9.997 | 10 29 41.4 | 57.53 | 3 16.7 |
| 6 | 13 56 40.48 | -5.198 | -11 20 17.5 | +29.06 | 15 14.1 | Sept. 2 | 13 47 31.70 | 10.498 | -10 33 37.6 | -60.54 | 3 1.7 |
| 10 | 13 56 18.57 | 5.890 | 11 18 13.8 | 32.78 | 14 58.0 | 6 | 13 48 14.78 | 11.036 | 10 37 45.4 | 63.34 | 2 46.7 |
| 14 | 13 55 53.98 | 6.469 | 11 15 55.6 | 36.26 | 14 41.9 | 10 | 13 48 59.04 | 11.535 | 10 42 4.0 | 65.91 | 2 31.7 |
| 18 | 13 55 26.89 | 7.066 | 11 13 24.0 | 39.48 | 14 25.7 | 14 | 13 49 47.02 | 11.997 | 10 46 32.4 | 68.94 | 2 16.7 |
| 22 | 13 54 57.52 | 7.609 | 11 10 40.2 | 42.40 | 14 9.5 | 18 | 13 50 35.87 | 12.422 | 10 51 9.6 | 70.34 | 2 1.8 |
| 26 | 13 54 26.09 | -8.096 | -11 7 45.3 | +45.00 | 13 53.3 | 22 | 13 51 26.34 | 12.811 | -10 55 54.8 | -72.22 | 1 46.9 |
| 30 | 13 53 52.82 | 8.596 | 11 4 40.6 | 47.30 | 13 37.0 | 26 | 13 52 18.31 | 13.164 | 11 0 47.1 | 73.90 | 1 32.1 |
| Apr. 3 | 13 53 17.95 | 8.898 | 11 1 27.3 | 49.30 | 13 20.7 | 30 | 13 53 11.61 | 13.479 | 11 5 45.7 | 75.34 | 1 17.2 |
| 7 | 13 52 41.72 | 9.210 | 10 58 6.6 | 50.97 | 13 4.4 | Oct. 4 | 13 54 6.08 | 13.750 | 11 10 49.5 | 76.59 | 1 2.4 |
| 11 | 13 52 4.36 | 9.456 | 10 54 40.0 | 52.98 | 12 48.0 | 8 | 13 55 1.55 | 13.975 | 11 15 57.5 | 77.44 | 0 47.6 |
| 15 | 13 51 26.16 | -9.632 | -10 51 8.9 | +53.90 | 12 31.6 | 12 | 13 55 57.82 | 14.153 | -11 21 8.6 | -78.00 | 0 32.8 |
| 19 | 13 50 47.40 | 9.735 | 10 47 34.9 | 53.73 | 12 15.3 | 16 | 13 56 54.71 | 14.289 | 11 26 21.9 | 78.49 | 0 18.0 |
| 23 | 13 50 8.37 | 9.771 | 10 43 59.6 | 53.87 | 11 58.9 | 20 | 13 57 52.07 | 14.383 | 11 31 36.2 | 78.65 | 0 2.2 |
| 27 | 13 49 29.32 | 9.741 | 10 40 24.4 | 53.65 | 11 42.5 | 24 | 13 58 49.72 | 14.434 | 11 36 50.8 | 78.59 | 23 44.7 |
| May 1 | 13 48 50.52 | 9.648 | 10 36 50.8 | 53.08 | 11 26.1 | 28 | 13 59 47.48 | 14.439 | 11 42 4.6 | 78.30 | 23 30.0 |
| 5 | 13 48 12.22 | -9.491 | -10 33 20.2 | +52.16 | 11 9.8 | Nov. 1 | 14 0 45.17 | 14.397 | -11 47 16.7 | -77.72 | 23 15.2 |
| 9 | 13 47 34.68 | 9.268 | 10 29 54.0 | 50.87 | 10 53.4 | 5 | 14 1 42.59 | 14.305 | 11 52 26.0 | 76.87 | 23 0.4 |
| 13 | 13 46 58.16 | 8.981 | 10 26 33.7 | 49.21 | 10 37.1 | 9 | 14 2 39.54 | 14.169 | 11 57 31.4 | 75.76 | 22 45.6 |
| 17 | 13 46 22.92 | 8.699 | 10 23 20.8 | 47.18 | 10 20.8 | 13 | 14 3 35.83 | 13.973 | 12 2 31.8 | 74.42 | 22 30.9 |
| 21 | 13 45 49.21 | 8.221 | 10 20 16.7 | 44.83 | 10 4.5 | 17 | 14 4 31.27 | 13.741 | 12 7 26.5 | 72.86 | 22 16.1 |
| 25 | 13 45 17.22 | -7.763 | -10 17 22.6 | +42.19 | 9 48.3 | 21 | 14 5 25.70 | 13.465 | -12 12 14.4 | -71.08 | 22 1.2 |
| 29 | 13 44 47.17 | 7.258 | 10 14 39.5 | 39.98 | 9 32.0 | 25 | 14 6 18.93 | 13.142 | -12 16 54.8 | 69.07 | 21 46.4 |
| June 2 | 13 44 19.22 | 6.709 | 10 12 8.6 | 36.13 | 9 15.9 | 29 | 14 7 10.77 | 12.771 | -12 21 26.6 | 66.82 | 21 31.5 |
| 6 | 13 43 53.56 | 6.115 | 10 9 50.8 | 32.72 | 8 59.1 | Dec. 3 | 14 8 1.03 | 12.350 | -12 25 49.0 | 64.33 | 21 16.6 |
| 10 | 13 43 30.36 | 5.478 | 10 7 47.2 | 29.07 | 8 43.6 | 7 | 14 8 49.51 | 11.883 | -12 30 1.0 | 61.61 | 21 1.6 |
| 14 | 13 43 9.78 | -4.805 | -10 5 58.6 | +25.90 | 8 27.5 | 11 | 14 9 36.04 | 11.375 | -12 34 1.7 | -58.69 | 20 46.7 |
| 18 | 13 42 51.95 | 4.103 | 10 4 25.8 | 21.15 | 8 11.5 | 15 | 14 10 20.46 | 10.827 | -12 37 50.3 | 55.61 | 20 31.7 |
| 22 | 13 42 36.99 | 3.377 | 10 3 9.5 | 16.98 | 7 55.5 | 19 | 14 11 2.61 | 10.242 | -12 41 26.3 | 52.36 | 20 16.6 |
| 26 | 13 42 24.96 | 2.639 | 10 2 10.1 | 12.72 | 7 39.6 | 23 | 14 11 42.34 | 9.616 | -12 44 49.0 | 48.93 | 20 1.6 |
| 30 | 13 42 15.95 | 1.873 | 10 1 27.9 | 8.37 | 7 23.7 | 27 | 14 12 19.49 | 8.951 | -12 47 57.6 | 45.32 | 19 46.5 |
| July 4 | 13 42 10.00 | -1.096 | -10 1 3.3 | +3.93 | 7 7.9 | 31 | 14 12 53.90 | +8.949 | -12 50 51.3 | -41.55 | 19 31.3 |

Greatest horizontal parallax,
Least horizontal parallax,

April 20, 0".51.
October 24, 0".45.

Greatest semidiameter,
Least semidiameter,

April 20, 1".92.
October 24, 1".72.

GREENWICH MEAN TIME.

| Month and Day. | Apparent Right Ascension. | Var. of R. A. for 1 Day. | Apparent Declination. | Var. of Decl. for 1 Day. | Meridian Passage. | Month and Day. | Apparent Right Ascension. | Var. of R. A. for 1 Day. | Apparent Declination. | Var. of Decl. for 1 Day. | Meridian Passage. |
|----------------------|---------------------------------|-----------------------------------|--------------------------|-----------------------------------|----------------------|----------------------|---------------------------------|-----------------------------------|--------------------------|-----------------------------------|----------------------|
| | Noon. | Noon. | Noon. | Noon. | | | Noon. | Noon. | Noon. | Noon. | |
| | <i>h m s</i> | <i>s</i> | <i>° ' "</i> | <i>"</i> | <i>h m</i> | | <i>h m s</i> | <i>s</i> | <i>° ' "</i> | <i>"</i> | <i>h m</i> |
| Jan. 1 | 4 11 22.53 | -5.429 | +19 25 22.1 | -11.74 | 9 26.4 | July 4 | 4 25 16.50 | +8.116 | +20 5 41.6 | +17.10 | 21 33.0 |
| 5 | 4 11 1.57 | 5.045 | 19 24 37.4 | 10.59 | 9 10.3 | 8 | 4 25 48.39 | 7.992 | 20 6 48.1 | 16.14 | 21 17.8 |
| 9 | 4 10 42.22 | 4.623 | 19 23 57.5 | 9.34 | 8 54.3 | 12 | 4 26 19.04 | 7.498 | 20 7 50.7 | 15.15 | 21 2.6 |
| 13 | 4 10 24.63 | 4.171 | 19 23 22.8 | 8.00 | 8 38.3 | 16 | 4 26 48.34 | 7.149 | 20 8 49.3 | 14.14 | 20 47.3 |
| 17 | 4 10 8.89 | 3.693 | 19 22 53.6 | 6.60 | 8 22.3 | 20 | 4 27 16.20 | 6.776 | 20 9 43.8 | 13.09 | 20 32.0 |
| 21 | 4 9 55.12 | -3.191 | +19 22 30.1 | -5.15 | 8 6.3 | 24 | 4 27 42.52 | +6.381 | +20 10 34.0 | +12.01 | 20 16.7 |
| 25 | 4 9 43.39 | 2.670 | 19 22 12.6 | 3.67 | 7 50.4 | 28 | 4 28 7.22 | 5.964 | 20 11 19.8 | 10.88 | 20 1.4 |
| 29 | 4 9 33.78 | 2.136 | 19 22 1.0 | 2.16 | 7 34.6 | Aug. 1 | 4 28 30.20 | 5.529 | 20 12 1.0 | 9.73 | 19 46.1 |
| Feb. 2 | 4 9 26.33 | 1.584 | 19 21 55.4 | -0.62 | 7 18.7 | 5 | 4 28 51.37 | 5.068 | 20 12 37.6 | 8.55 | 19 30.7 |
| 6 | 4 9 21.13 | 1.017 | 19 21 56.1 | +0.95 | 7 2.9 | 9 | 4 29 10.64 | 4.579 | 20 13 9.4 | 7.37 | 19 15.3 |
| 10 | 4 9 18.20 | -0.445 | +19 22 3.0 | +2.51 | 6 47.1 | 13 | 4 29 27.93 | +4.079 | +20 13 36.5 | +6.15 | 18 59.8 |
| 14 | 4 9 17.58 | +0.134 | 19 22 16.2 | 4.09 | 6 31.4 | 17 | 4 29 43.20 | 3.558 | 20 13 58.6 | 4.92 | 18 44.3 |
| 18 | 4 9 19.28 | 0.719 | 19 22 35.7 | 5.64 | 6 15.7 | 21 | 4 29 56.38 | 3.032 | 20 14 15.9 | 3.71 | 18 28.8 |
| 22 | 4 9 23.28 | 1.285 | 19 23 1.3 | 7.17 | 6 0.0 | 25 | 4 30 7.44 | 2.495 | 20 14 28.3 | 2.49 | 18 13.3 |
| 26 | 4 9 29.56 | 1.855 | 19 23 33.0 | 8.64 | 5 44.4 | 29 | 4 30 16.32 | 1.944 | 20 14 35.8 | 1.96 | 17 57.7 |
| Mar. 2 | 4 9 38.12 | +2.420 | +19 24 10.4 | +10.08 | 5 28.8 | Sept. 2 | 4 30 22.98 | +1.386 | +20 14 38.4 | +0.02 | 17 42.1 |
| 6 | 4 9 48.91 | 2.977 | 19 24 53.6 | 11.51 | 5 13.2 | 6 | 4 30 27.39 | 0.891 | 20 14 36.0 | -1.22 | 17 26.4 |
| 10 | 4 10 1.92 | 3.524 | 19 25 42.4 | 12.87 | 4 57.7 | 10 | 4 30 29.54 | +0.357 | 20 14 28.7 | 2.43 | 17 10.7 |
| 14 | 4 10 17.08 | 4.054 | 19 26 36.5 | 14.16 | 4 42.3 | 14 | 4 30 29.45 | -0.304 | 20 14 16.6 | 3.61 | 16 55.0 |
| 18 | 4 10 34.33 | 4.586 | 19 27 35.6 | 15.37 | 4 26.8 | 18 | 4 30 27.11 | 0.869 | 20 14 0.0 | 4.77 | 16 39.2 |
| 22 | 4 10 53.58 | +5.058 | +19 28 39.4 | +16.54 | 4 11.4 | 22 | 4 30 22.56 | -1.415 | +20 13 38.7 | -5.91 | 16 23.4 |
| 26 | 4 11 14.77 | 5.531 | 19 29 47.7 | 17.60 | 3 56.1 | 26 | 4 30 15.80 | 1.961 | 20 13 12.8 | 7.03 | 16 7.6 |
| 30 | 4 11 37.80 | 5.981 | 19 31 0.1 | 18.59 | 3 40.7 | 30 | 4 30 6.89 | 2.495 | 20 12 42.5 | 8.10 | 15 51.7 |
| Apr. 3 | 4 12 2.59 | 6.411 | 19 32 16.3 | 19.50 | 3 25.4 | Oct. 4 | 4 29 55.86 | 3.016 | 20 12 8.0 | 9.13 | 15 35.8 |
| 7 | 4 12 29.06 | 6.890 | 19 33 36.0 | 20.34 | 3 10.1 | 8 | 4 29 42.79 | 2.516 | 20 11 29.5 | 10.11 | 15 19.8 |
| 11 | 4 12 57.11 | +7.199 | +19 34 58.9 | +21.06 | 2 54.8 | 12 | 4 29 27.76 | -3.996 | +20 10 47.2 | -11.03 | 15 3.8 |
| 15 | 4 13 26.61 | 7.547 | 19 36 24.5 | 21.73 | 2 39.6 | 16 | 4 29 10.86 | 4.448 | 20 10 1.3 | 11.90 | 14 47.8 |
| 19 | 4 13 57.45 | 7.867 | 19 37 52.6 | 22.28 | 2 24.4 | 20 | 4 28 52.21 | 4.873 | 20 9 12.1 | 12.70 | 14 31.8 |
| 23 | 4 14 29.51 | 8.180 | 19 39 22.6 | 22.79 | 2 9.2 | 24 | 4 28 31.91 | 5.273 | 20 8 19.8 | 13.43 | 14 15.7 |
| 27 | 4 15 2.69 | 8.494 | 19 40 54.3 | 23.10 | 1 54.0 | 28 | 4 28 10.07 | 5.641 | 20 7 24.7 | 14.11 | 13 59.6 |
| May 1 | 4 15 36.86 | +8.657 | +19 42 27.3 | +23.29 | 1 38.8 | Nov. 1 | 4 27 46.83 | -5.974 | +20 6 27.0 | -14.71 | 13 43.5 |
| 5 | 4 16 11.91 | 8.863 | 19 44 1.3 | 23.59 | 1 23.7 | 5 | 4 27 22.33 | 6.298 | 20 5 27.2 | 15.20 | 13 27.4 |
| 9 | 4 16 47.72 | 9.037 | 19 45 35.9 | 23.70 | 1 8.6 | 9 | 4 26 56.74 | 6.519 | 20 4 25.7 | 15.59 | 13 11.2 |
| 13 | 4 17 24.16 | 9.176 | 19 47 10.8 | 23.73 | 0 53.4 | 13 | 4 26 30.23 | 6.729 | 20 3 22.7 | 15.86 | 12 55.0 |
| 17 | 4 18 1.08 | 9.280 | 19 48 45.6 | 23.64 | 0 38.3 | 17 | 4 26 2.96 | 6.898 | 20 2 18.8 | 16.08 | 12 38.9 |
| 21 | 4 18 38.36 | +9.355 | +19 50 19.8 | +23.47 | 0 23.2 | 21 | 4 25 35.10 | -7.085 | +20 1 14.2 | -16.21 | 12 22.7 |
| 25 | 4 19 15.88 | 9.400 | 19 51 53.3 | 23.25 | 0 8.1 | 25 | 4 25 6.82 | 7.107 | 20 0 9.3 | 16.22 | 12 6.5 |
| 29 | 4 19 53.52 | 9.414 | 19 53 25.7 | 23.25 | 23 49.2 | 29 | 4 24 38.31 | 7.140 | 19 59 4.6 | 16.12 | 11 50.3 |
| June 2 | 4 20 31.15 | 9.395 | 19 54 56.8 | 23.57 | 23 34.1 | Dec. 3 | 4 24 9.76 | 7.127 | 19 58 0.5 | 15.89 | 11 34.1 |
| 6 | 4 21 8.64 | 9.346 | 19 56 26.2 | 23.11 | 23 19.0 | 7 | 4 23 41.36 | 7.064 | 19 56 57.6 | 15.58 | 11 17.9 |
| 10 | 4 21 45.87 | +9.269 | +19 57 53.6 | +21.57 | 23 3.9 | 11 | 4 23 13.31 | -6.955 | +19 55 56.0 | -15.16 | 11 1.7 |
| 14 | 4 22 22.69 | 9.144 | 19 59 18.7 | 20.97 | 22 48.8 | 15 | 4 22 45.78 | 6.801 | 19 54 56.5 | 14.69 | 10 45.5 |
| 18 | 4 22 58.98 | 8.996 | 20 0 41.3 | 20.31 | 22 33.6 | 19 | 4 22 18.96 | 6.606 | 19 53 59.3 | 13.98 | 10 29.3 |
| 22 | 4 23 34.62 | 8.820 | 20 2 1.1 | 19.57 | 22 18.5 | 23 | 4 21 52.99 | 6.370 | 19 53 4.8 | 13.24 | 10 13.2 |
| 26 | 4 24 9.50 | 8.615 | 20 3 17.8 | 18.79 | 22 3.3 | 27 | 4 21 28.06 | 6.088 | 19 52 13.5 | 12.42 | 9 57.0 |
| 30 | 4 24 43.50 | +8.380 | +20 4 31.4 | +17.99 | 21 48.2 | 31 | 4 21 4.34 | -5.765 | +19 51 25.6 | -11.50 | 9 40.9 |
| July 4 | 4 25 16.50 | +8.116 | +20 5 41.6 | +17.10 | 21 33.0 | | | | | | |

* Greatest horizontal parallax, November 29, 0".31.
Least horizontal parallax, May 29, 0".29.

Greatest semidiameter,
Least semidiameter,

November 29, 1".28.
May 29, 1".25.

| MERCURY. | | | | | | | | |
|----------------------|---|---------------|---------------------|------------------------|---------------|-----------------------------|-----------------------------------|-----------------------|
| GREENWICH MEAN NOON. | | | | | | | | |
| Date. | Heliocentric Longitude, Mean Equinox of Date. | Daily Motion. | Reduction to Orbit. | Heliocentric Latitude. | Daily Motion. | Logarithm of Radius Vector. | Logarithm of Distance from Earth— | |
| | | | | | | | At Date. | At Intermediate Date. |
| Jan.—1 | 26 22 51.8 | 5 34 42.5 | — 8 31.2 | —2 28 51.6 | +38 24.0 | 9.5146418 | 9.9721682 | 9.9598419 |
| 1 | 37 49 9.1 | 5 51 14.7 | — 4 5.1 | —1 7 37.5 | 42 34.4 | 9.5038485 | 9.9471612 | 9.9342133 |
| 3 | 49 46 1.4 | 6 5 3.4 | + 1 13.7 | +0 20 7.5 | 44 47.4 | 9.4953969 | 9.9211134 | 9.9080066 |
| 5 | 62 6 37.4 | 6 14 45.1 | 6 29.2 | 1 49 47.6 | 44 34.2 | 9.4899179 | 9.8950744 | 9.8825179 |
| 7 | 74 41 29.4 | 6 19 9.1 | 10 36.5 | 3 15 47.9 | 41 7.0 | 9.4878657 | 9.8705711 | 9.8594834 |
| 9 | 87 19 15.1 | 6 17 35.8 | +12 42.4 | +4 32 28.7 | +35 9.6 | 9.4894203 | 9.8495101 | 9.8408948 |
| 11 | 99 47 56.5 | 6 10 9.4 | 12 23.3 | 5 35 8.2 | 27 15.9 | 9.4944447 | 9.8338627 | 9.8285523 |
| 13 | 111 56 29.0 | 5 57 38.4 | 9 51.8 | 6 20 51.9 | 18 24.3 | 9.5025180 | 9.8251009 | 9.8235361 |
| 15 | 123 36 0.4 | 5 41 23.2 | 5 47.8 | 6 48 47.7 | 9 37.0 | 9.5130264 | 9.8238237 | 9.8258659 |
| 17 | 134 40 32.6 | 5 29 54.4 | + 1 3.2 | 6 59 49.9 | + 1 36.6 | 9.5252797 | 9.8295104 | 9.8345691 |
| 19 | 145 7 5.4 | 5 3 36.5 | — 3 34.2 | +6 56 3.1 | — 5 10.0 | 9.5386049 | 9.8408346 | 9.8480931 |
| 21 | 154 55 9.8 | 4 44 35.1 | 7 30.1 | 6 40 4.2 | 10 35.4 | 9.5524148 | 9.8561378 | 9.8647783 |
| 23 | 164 6 7.2 | 4 26 35.5 | 10 24.4 | 6 14 33.3 | 14 43.5 | 9.5662328 | 9.8738440 | 9.8831879 |
| 25 | 172 42 30.8 | 4 10 4.1 | 12 10.9 | 5 41 55.3 | 17 44.5 | 9.5796944 | 9.8926861 | 9.9022358 |
| 27 | 180 47 30.9 | 3 55 13.4 | 12 51.4 | 5 4 13.3 | 19 40.6 | 9.5925358 | 9.9117540 | 9.9211753 |
| 29 | 188 24 33.5 | 3 42 6.1 | —12 33.9 | +4 23 5.9 | —21 11.4 | 9.6045732 | 9.9304483 | 9.9395352 |
| 31 | 195 37 2.1 | 3 30 38.8 | 11 28.3 | 3 39 50.2 | 21 59.5 | 9.6156853 | 9.9484072 | 9.9570439 |
| Feb. 2 | 202 28 11.7 | 3 20 45.9 | 9 45 6 | 2 55 24.8 | 22 22.2 | 9.6257960 | 9.9654316 | 9.9735627 |
| 4 | 209 1 3.6 | 3 12 19.8 | 7 35.8 | 2 10 33.8 | 22 26.0 | 9.6348619 | 9.9814325 | 9.9890401 |
| 6 | 215 18 24.1 | 3 5 13.4 | 5 8.6 | 1 25 50.0 | 22 15.8 | 9.6428008 | 9.9963873 | 0.0024776 |
| 8 | 221 22 45.3 | 2 59 19.4 | — 2 32.2 | +0 41 37.7 | —21 55.1 | 9.6497855 | 0.0103155 | 0.0169069 |
| 10 | 227 16 25.8 | 2 54 31.7 | + 0 6.4 | —0 1 44.9 | 21 26.3 | 9.6556369 | 0.0232582 | 0.0293762 |
| 12 | 233 1 32.8 | 2 50 45.2 | 2 40.9 | 0 44 3.5 | 20 51.4 | 9.6604207 | 0.0352682 | 0.0409415 |
| 14 | 238 40 4.5 | 2 47 55.6 | 5 6.0 | 1 25 7.2 | 20 11.5 | 9.6641448 | 0.0464030 | 0.0516596 |
| 16 | 244 13 50.6 | 2 45 59.2 | 7 17.4 | 2 4 46.6 | 19 37.2 | 9.6668167 | 0.0567183 | 0.0615857 |
| 18 | 249 44 35.6 | 2 44 54.2 | + 9 11.5 | —2 42 53.1 | —18 38.7 | 9.6684428 | 0.0662678 | 0.0707710 |
| 20 | 255 14 0.3 | 2 44 38.6 | 10 44.6 | 3 19 18.4 | 17 45.9 | 9.6690273 | 0.0751004 | 0.0792609 |
| 22 | 260 43 42.7 | 2 45 12.0 | 11 53.9 | 3 53 53.5 | 16 48.4 | 9.6685717 | 0.0832574 | 0.0870942 |
| 24 | 266 15 20.9 | 2 46 34.4 | 12 37.2 | 4 26 28.3 | 15 45.4 | 9.6670747 | 0.0907752 | 0.0943037 |
| 26 | 271 50 33.6 | 2 48 46.8 | 12 52.3 | 4 56 50.9 | 14 36.0 | 9.6645326 | 0.0976825 | 0.1009138 |
| 28 | 277 31 2.5 | 2 51 50.8 | +12 37.7 | —5 24 47.2 | —13 18.8 | 9.6609393 | 0.1040001 | 0.1069425 |
| Mar. 2 | 283 18 33.3 | 2 55 49.4 | 11 52.4 | 5 49 59.8 | 11 52.1 | 9.6562871 | 0.1097418 | 0.1123987 |
| 4 | 289 14 58.7 | 3 0 45.8 | 10 35.8 | 6 12 7.9 | 10 13.9 | 9.6505678 | 0.1149129 | 0.1172838 |
| 6 | 295 22 17.7 | 3 6 43.8 | 8 48.4 | 6 30 45.9 | 8 21.4 | 9.6437761 | 0.1195097 | 0.1215887 |
| 8 | 301 42 38.5 | 3 13 48.6 | 6 32.4 | 6 45 22.9 | 6 12.2 | 9.6359095 | 0.1235182 | 0.1252946 |
| 10 | 308 18 20.3 | 3 22 5.5 | + 3 50.8 | —6 55 21.7 | — 3 42.8 | 9.6269743 | 0.1269137 | 0.1283704 |
| 12 | 315 11 52.5 | 3 31 40.1 | + 0 49.3 | 6 59 58.2 | — 0 49.3 | 9.6169904 | 0.1296585 | 0.1307712 |
| 14 | 322 25 56.3 | 3 42 38.0 | — 2 24.1 | 6 58 20.5 | + 2 32.0 | 9.6059983 | 0.1317003 | 0.1324366 |
| 16 | 330 3 22.9 | 3 55 3.8 | 5 37.9 | 6 49 29.3 | 6 24.8 | 9.5940692 | 0.1329697 | 0.1332879 |
| 18 | 338 7 10.5 | 4 8 59.0 | 8 37.0 | 6 32 18.8 | 10 51.5 | 9.5813181 | 0.1333783 | 0.1332263 |
| 20 | 346 40 17.7 | 4 24 22.7 | —11 2.6 | —6 5 40.3 | +15 52.6 | 9.5679201 | 0.1328160 | 0.1321302 |
| 22 | 355 45 33.6 | 4 41 5.6 | 12 33.2 | 5 28 28.0 | 21 24.2 | 9.5541281 | 0.1311500 | 0.1298551 |
| 24 | 5 25 21.3 | 4 58 50.1 | 12 47.3 | 4 39 50.1 | 27 15.8 | 9.5402933 | 0.1292242 | 0.1282348 |
| 26 | 15 41 13.9 | 5 17 4.0 | 11 27.5 | 3 39 24.6 | 33 7.6 | 9.5268781 | 0.1283632 | 0.1210857 |
| 28 | 26 33 24.7 | 5 34 58.8 | 8 27.8 | 2 27 40.2 | 38 28.7 | 9.5144574 | 0.1178790 | 0.1142194 |
| 30 | 38 0 13.0 | 5 51 29.2 | — 4 0.3 | —1 6 16.1 | +42 37.5 | 9.5036948 | 0.1100846 | 0.1054549 |
| 32 | 49 57 31.6 | 6 5 14.8 | + 1 18.8 | +0 21 30.9 | +44 48.3 | 9.4952847 | 0.1003138 | 0.0946473 |

MERCURY.

GREENWICH MEAN NOON.

| Date. | Heliocentric Longitude, Mean Equinox of Date. | Daily Motion. | Reduction to Orbit. | Heliocentric Latitude. | Daily Motion. | Logarithm of Radius Vector. | Logarithm of Distance from Earth— | |
|--------|--|------------------|---------------------------|---------------------------|------------------|--------------------------------------|--------------------------------------|----------------------------|
| | | | | | | | At Date. | At Interme- diate Date. |
| Apr. 1 | 0° 57' 31.6 | 6 5 14.8 | + 1 18.8 | +0 21' 30.9 | +44 48.3 | 9.4952847 | 0.1003138 | 0.0946473 |
| 3 | 62 18 26.4 | 6 14 52.0 | 6 33.5 | 1 51 10.3 | 44 22.5 | 9.4898557 | 0.0884460 | 0.0817058 |
| 5 | 74 53 26.9 | 6 19 10.7 | 10 39.4 | 3 17 4.6 | 41 9.7 | 9.4878587 | 0.0744280 | 0.0666196 |
| 7 | 87 31 10.2 | 6 17 31.8 | 12 43.2 | 4 33 34.2 | 35 3.0 | 9.4894689 | 0.0582935 | 0.0494676 |
| 9 | 99 59 38.1 | 6 10 0.0 | 12 21.9 | 5 35 59.0 | 27 7.3 | 9.4945419 | 0.0401652 | 0.0304140 |
| 11 | 112 7 47.4 | 5 57 24.8 | + 9 48.6 | +6 21 26.1 | +18 16.0 | 9.5026610 | 0.0202453 | 0.0096941 |
| 13 | 123 46 48.3 | 5 41 6.7 | 5 43.7 | 6 49 5.5 | 9 28.5 | 9.5132028 | 9.9987973 | 9.9875935 |
| 15 | 134 50 46.1 | 5 29 26.5 | + 0 56.8 | 6 59 52.8 | + 1 22.6 | 9.5254776 | 9.9761230 | 9.9644276 |
| 17 | 145 16 42.5 | 5 3 18.2 | - 3 38.2 | 6 55 53.4 | - 5 15.7 | 9.5388153 | 9.9525499 | 9.9405327 |
| 19 | 155 4 11.2 | 4 44 17.6 | 7 33.3 | 6 39 44.4 | 10 39.8 | 9.5526292 | 9.9284195 | 9.9162562 |
| 21 | 164 14 34.7 | 4 26 19.2 | -10 26.6 | +6 14 5.6 | -14 46.8 | 9.5664446 | 9.9040889 | 9.8919653 |
| 23 | 172 50 27.3 | 4 9 49.4 | 12 12.0 | 5 41 22.1 | 17 46.5 | 9.5798991 | 9.8799352 | 9.8680501 |
| 25 | 180 54 59.7 | 3 58 0.2 | 12 51.6 | 5 3 36.3 | 19 51.2 | 9.5927296 | 9.8563629 | 9.8449295 |
| 27 | 188 31 37.3 | 3 41 54.4 | 12 33.2 | 4 22 26.4 | 21 12.3 | 9.6047539 | 9.8338078 | 9.8230577 |
| 29 | 195 43 44.3 | 3 30 28.7 | 11 27.0 | 3 39 9.3 | 22 0.0 | 9.6158511 | 9.8127404 | 9.8029182 |
| May 1 | 202 34 35.1 | 3 20 37.3 | - 9 43.6 | +2 54 43.2 | -22 22.4 | 9.6259460 | 9.7936534 | 9.7850075 |
| 3 | 209 7 11.4 | 3 12 19.7 | 7 33.8 | 2 9 52.0 | 22 28.2 | 9.6349957 | 9.7770413 | 9.7698122 |
| 5 | 215 24 18.7 | 3 5 7.3 | 5 6.2 | 1 25 8.5 | 22 15.5 | 9.6429780 | 9.7633726 | 9.7577693 |
| 7 | 221 28 29.0 | 2 59 14.4 | - 2 29.8 | +0 40 56.9 | 21 54.6 | 9.6498861 | 9.7530425 | 9.7492232 |
| 9 | 227 22 0.5 | 2 54 28.0 | + 0 8.9 | -0 2 24.8 | 21 25.6 | 9.6557209 | 9.7463332 | 9.7443845 |
| 11 | 233 7 0.6 | 2 50 42.2 | + 2 43.3 | -0 44 42.3 | -20 50.8 | 9.6604881 | 9.7433781 | 9.7433052 |
| 13 | 238 45 27.0 | 2 47 53.4 | 5 8.2 | 1 25 44.8 | 20 10.2 | 9.6641956 | 9.7441465 | 9.7458727 |
| 15 | 244 19 9.7 | 2 45 57.8 | 7 19.3 | 2 5 22.8 | 19 26.4 | 9.6668510 | 9.7484480 | 9.7518283 |
| 17 | 249 49 52.5 | 2 44 53.5 | 9 13.0 | 2 43 27.8 | 18 37.9 | 9.6684608 | 9.7559653 | 9.7608070 |
| 19 | 255 19 16.9 | 2 44 28.8 | 10 45.8 | 3 19 51.5 | 17 45.0 | 9.6690289 | 9.7662974 | 9.7723804 |
| 21 | 260 49 0.4 | 2 45 19.2 | +11 54.8 | -3 54 24.7 | -16 47.4 | 9.6685569 | 9.7789994 | 9.7860994 |
| 23 | 266 20 41.1 | 2 46 36.0 | 12 37.6 | 4 26 57.6 | 15 44.4 | 9.6670436 | 9.7936271 | 9.8015321 |
| 25 | 271 55 57.8 | 2 48 49.2 | 12 52.3 | 4 57 18.1 | 14 34.9 | 9.6644852 | 9.8097661 | 9.8182846 |
| 27 | 277 36 32.2 | 2 51 54.1 | 12 37.2 | 5 25 11.9 | 13 17.5 | 9.6608753 | 9.8270462 | 9.8360127 |
| 29 | 283 24 10.5 | 2 55 53.6 | 11 51.3 | 5 50 21.8 | 11 50.7 | 9.6562064 | 9.8451500 | 9.8544262 |
| 31 | 289 20 45.0 | 3 0 50.8 | +10 34.3 | -6 12 26.9 | -10 12.2 | 9.6504706 | 9.8638126 | 9.8732831 |
| June 2 | 295 28 15.0 | 3 6 49.8 | 8 46.6 | 6 31 1.4 | 8 19.7 | 9.6436620 | 9.8828144 | 9.8923858 |
| 4 | 301 48 48.9 | 3 13 55.7 | 6 30.2 | 6 45 34.4 | 6 10.2 | 9.6357785 | 9.9019778 | 9.9115724 |
| 6 | 308 24 46.0 | 3 22 13.8 | 3 48.2 | 6 55 28.6 | 3 40.3 | 9.6268268 | 9.9211540 | 9.9307067 |
| 8 | 315 18 36.1 | 3 31 49.8 | + 0 46.4 | 6 59 59.7 | - 0 46.4 | 9.6168268 | 9.9402169 | 9.9496708 |
| 10 | 322 33 0.6 | 3 42 48.9 | - 2 27.3 | -6 58 15.8 | + 2 35.6 | 9.6058193 | 9.9590548 | 9.9683558 |
| 12 | 330 10 50.2 | 3 55 15.8 | 5 40.9 | 6 49 17.3 | 5 28.6 | 9.5938763 | 9.9775608 | 9.9866562 |
| 14 | 338 15 3.8 | 4 9 12.8 | 8 39.5 | 6 31 58.5 | 10 55.9 | 9.5811139 | 9.9956278 | 0.0044609 |
| 16 | 346 48 39.9 | 4 24 37.5 | 11 4.5 | 6 5 10.6 | 15 57.6 | 9.5677076 | 0.0131400 | 0.0216484 |
| 18 | 355 54 27.0 | 4 41 21.8 | 12 34.0 | 5 27 48.1 | 21 22.5 | 9.5539122 | 0.0299685 | 0.0380807 |
| 20 | 5 34 48.1 | 4 59 7.1 | -12 46.8 | -4 38 59.2 | +27 21.3 | 9.5400802 | 0.0459651 | 0.0535999 |
| 22 | 15 51 14.8 | 5 17 21.0 | 11 25.5 | 3 38 22.8 | 33 12.2 | 9.5266758 | 0.0609627 | 0.0680294 |
| 24 | 26 43 59.4 | 5 35 15.2 | 8 24.3 | 2 26 28.4 | 38 33.2 | 9.5142760 | 0.0747750 | 0.0811746 |
| 26 | 38 11 18.7 | 5 51 43.6 | - 3 55.7 | -1 4 58.7 | 42 40.6 | 9.5035449 | 0.0872036 | 0.0926380 |
| 28 | 50 9 3.3 | 6 5 26.0 | + 1 23.9 | +0 22 54.5 | 44 49.2 | 9.4951764 | 0.0980547 | 0.1028330 |
| 30 | 62 30 15.7 | 6 14 58.6 | + 6 38.1 | +1 52 33.0 | +44 20.7 | 9.4897980 | 0.1071554 | 0.1110073 |
| 32 | 75 5 24.0 | 6 19 12.1 | +10 42.5 | +3 12 21.0 | +40 58.3 | 9.4878565 | 0.1143784 | 0.1172634 |

MERCURY.

GREENWICH MEAN NOON.

| Date. | Heliocentric Longitude, Mean Equinox of Date. | Daily Motion. | Reduction to Orbit. | Heliocentric Latitude. | Daily Motion. | Logarithm of Radius Vector. | Logarithm of Distance from Earth— | |
|---------|---|---------------|---------------------|------------------------|---------------|-----------------------------|-----------------------------------|-----------------------|
| | | | | | | | At Date. | At Intermediate Date. |
| July 2 | 75 5 24.0 | 6 19 12.1 | +10 42.5 | +3 18 21.0 | +40 58.3 | 9.4878565 | 0.1143784 | 0.1172634 |
| | 87 43 4.5 | 6 17 27.4 | 12 44.0 | 4 34 39.5 | 34 56.4 | 9.4895222 | 0.1196615 | 0.1215763 |
| | 100 11 18.1 | 6 9 50.3 | 12 20.6 | 5 36 49.5 | 26 59.2 | 9.4946492 | 0.1230161 | 0.1239937 |
| | 112 19 3.8 | 5 57 41.0 | 9 45.5 | 6 22 0.0 | 18 7.6 | 9.5028085 | 0.1245244 | 0.1246273 |
| | 123 57 34.2 | 5 40 50.2 | 5 39.4 | 6 49 23.1 | 9 20.6 | 9.5133827 | 0.1243231 | 0.1236335 |
| | 135 0 57.6 | 5 22 19.5 | + 0 54.3 | +6 59 55.5 | + 1 22.7 | 9.5256792 | 0.1225816 | 0.1211904 |
| | 145 26 17.9 | 5 3 0.2 | - 3 42.2 | 6 55 43.5 | - 5 21.3 | 9.5390287 | 0.1194820 | 0.1174786 |
| | 155 13 11.2 | 4 44 0.2 | 7 36.5 | 6 39 24.5 | 10 44.0 | 9.5528460 | 0.1152005 | 0.1126671 |
| | 164 22 1.1 | 4 26 9.9 | 10 28.8 | 6 13 38.1 | 14 50.1 | 9.5666584 | 0.1098968 | 0.1069060 |
| | 172 58 22.7 | 4 9 34.9 | 12 13.1 | 5 40 49.0 | 17 48.9 | 9.5801050 | 0.1037095 | 0.1003209 |
| 20 | 181 2 27.8 | 3 54 47.3 | -12 51.8 | +5 2 59.3 | -19 52.8 | 9.5929242 | 0.0967524 | 0.0930145 |
| | 188 38 40.8 | 3 41 42.9 | 12 32.5 | 4 21 46.9 | 21 13.3 | 9.6049348 | 0.0891171 | 0.0850682 |
| | 195 50 26.3 | 3 30 18.8 | 11 25.6 | 3 38 28.3 | 22 0.5 | 9.6160167 | 0.0808747 | 0.0765423 |
| | 202 40 58.8 | 3 20 28.8 | 9 41.8 | 2 54 1.6 | 22 22.6 | 9.6260953 | 0.0720765 | 0.0674811 |
| | 209 13 19.3 | 3 12 5.4 | 7 31.5 | 2 9 10.4 | 22 26.0 | 9.6351282 | 0.0627594 | 0.0579138 |
| | 215 30 13.3 | 3 5 1.2 | - 5 3.8 | +1 24 27.1 | -22 15.3 | 9.6430937 | 0.0529461 | 0.0478577 |
| | 221 34 12.3 | 2 59 9.5 | - 2 27.2 | +0 40 16.1 | 21 54.2 | 9.6499847 | 0.0426493 | 0.0373206 |
| | 227 27 35.4 | 2 54 23.9 | + 0 11.2 | -0 3 4.6 | 21 25.3 | 9.6558024 | 0.0318717 | 0.0263021 |
| | 233 12 28.4 | 2 50 39.1 | 2 45.6 | 0 45 21.1 | 20 50.2 | 9.6605527 | 0.0206112 | 0.0147975 |
| | 238 50 49.6 | 2 47 51.2 | 5 10.4 | 1 26 22.3 | 20 10.2 | 9.6642436 | 0.0068600 | 0.0027973 |
| Aug. 1 | 244 24 28.6 | 2 45 56.5 | + 7 21.2 | -2 5 58.9 | -19 25.7 | 9.6668825 | 9.9966083 | 9.9902915 |
| | 249 55 9.6 | 2 44 53.0 | 9 14.6 | 2 44 2.4 | 18 37.1 | 9.6684759 | 9.9838461 | 9.9772712 |
| | 255 24 33.5 | 2 44 39.0 | 10 47.1 | 3 20 24.5 | 17 44.2 | 9.6690278 | 9.9705666 | 9.9637328 |
| | 260 54 18.1 | 2 45 13.8 | 11 55.7 | 3 54 56.0 | 16 46.5 | 9.6685397 | 9.9567708 | 9.9496825 |
| | 266 26 1.3 | 2 46 38.0 | 12 38.2 | 4 27 26.9 | 15 43.4 | 9.6670100 | 9.9424711 | 9.9351413 |
| | 272 1 22.2 | 2 48 51.7 | +12 52.3 | -4 57 45.2 | -14 33.7 | 9.6644354 | 9.9276996 | 9.9201545 |
| | 277 42 2.6 | 2 51 57.5 | 12 36.7 | 5 25 36.7 | 13 16.3 | 9.6608093 | 9.9125172 | 9.9048021 |
| | 283 29 48.4 | 2 55 57.8 | 11 50.4 | 5 50 48.9 | 11 49.2 | 9.6561242 | 9.8970724 | 9.8892151 |
| | 289 26 32.3 | 3 0 56.0 | 10 32.8 | 6 12 45.9 | 10 10.6 | 9.6503720 | 9.8813929 | 9.8735937 |
| | 295 34 13.5 | 3 6 56.0 | 8 44.7 | 6 31 16.9 | 8 17.8 | 9.6435471 | 9.8658576 | 9.8582325 |
| 31 | 301 55 0.8 | 3 14 3.0 | + 6 27.8 | -6 45 45.9 | - 6 8.1 | 9.6356474 | 9.8507736 | 9.8435459 |
| | 308 31 13.7 | 3 22 22.2 | 3 45.4 | 6 55 35.5 | 3 37.8 | 9.6266798 | 9.8366245 | 9.8300938 |
| | 315 25 21.7 | 3 31 59.2 | + 0 43.4 | 7 0 1.1 | - 0 43.5 | 9.6166644 | 9.8240488 | 9.8185933 |
| | 322 40 6.4 | 3 42 59.8 | - 2 30.1 | 6 58 10.9 | + 2 38.7 | 9.6056424 | 9.8138386 | 9.8099018 |
| | 330 18 19.5 | 3 55 28.2 | 5 43.8 | 6 49 5.2 | 6 32.5 | 9.5936864 | 9.8069009 | 9.8049522 |
| | 338 22 59.1 | 4 9 26.4 | - 8 42.1 | -6 31 38.1 | +11 0.4 | 9.5809127 | 9.8041644 | 9.8046320 |
| | 346 57 3.8 | 4 24 52.5 | 11 6.4 | 6 4 40.8 | 16 2.5 | 9.5674987 | 9.8064295 | 9.8096075 |
| | 356 3 22.1 | 4 41 37.8 | 12 34.9 | 5 27 7.9 | 21 34.8 | 9.5537002 | 9.8141857 | 9.8201521 |
| | 5 44 15.8 | 4 59 23.7 | 12 46.3 | 4 38 8.2 | 27 26.7 | 9.5398714 | 9.8274613 | 9.8360369 |
| | 16 1 16.0 | 5 17 37.8 | 11 23.3 | 3 37 20.9 | 33 18.2 | 9.5264779 | 9.8457735 | 9.8565425 |
| Sept. 2 | 26 54 33.4 | 5 35 31.2 | - 8 20.7 | -2 25 16.6 | +38 37.8 | 9.5140986 | 9.8681972 | 9.8805804 |
| | 38 22 22.8 | 5 51 57.5 | - 3 51.1 | -1 3 39.4 | 49 43.5 | 9.5033986 | 9.8935296 | 9.9068823 |
| | 50 20 31.9 | 6 5 36.6 | + 1 28.9 | +0 24 17.7 | 44 50.0 | 9.4950717 | 9.9204813 | 9.9341787 |
| | 62 42 1.8 | 6 15 4.9 | 6 42.5 | 1 53 55.3 | 44 18.9 | 9.4897432 | 9.9478386 | 9.9613390 |
| | 75 17 17.3 | 6 19 12.9 | 10 45.3 | 3 19 36.9 | 40 53.8 | 9.4878565 | 9.9745743 | 9.9874547 |
| | 87 54 53.8 | 6 17 22.7 | +12 44.7 | +4 35 44.1 | +34 49.7 | 9.4895771 | 9.9999071 | 0.0118733 |
| | 100 22 52.6 | 6 9 40.2 | +12 19.1 | +5 37 39.3 | +26 51.3 | 9.4947541 | 0.0233111 | 0.0341914 |

MERCURY.

GREENWICH MEAN NOON.

| Date. | Heliocentric Longitude, Mean Equinox of Date. | Daily Motion. | Reduction to Orbit. | Heliocentric Latitude. | Daily Motion. | Logarithm of Radius Vector. | Logarithm of Distance from Earth— | |
|--------|--|------------------|---------------------------|---------------------------|------------------|--------------------------------------|--------------------------------------|----------------------------|
| | | | | | | | At Date. | At Inter- mediate Date. |
| Oct. 2 | 100 22 52.6 | 6 9 40.3 | +12 19.1 | +5 37 39.3 | +26 51.3 | 9.4947541 | 0.0233111 | 0.0341914 |
| 4 | 112 30 13.6 | 5 56 57.2 | 9 42.2 | 6 22 33.6 | 17 59.3 | 9.5029550 | 0.0444978 | 0.0542231 |
| 6 | 124 8 14.5 | 5 40 34.1 | 5 35.2 | 6 49 40.2 | 9 19.8 | 9.5135602 | 0.0633691 | 0.0719457 |
| 8 | 135 11 3.2 | 5 23 0.8 | + 0 49.8 | 6 59 58.0 | + 1 15.9 | 9.5258773 | 0.0799667 | 0.0874509 |
| 10 | 145 35 47.6 | 5 2 42.3 | - 3 46.2 | 6 55 33.5 | - 5 27.0 | 9.5392378 | 0.0944192 | 0.1006948 |
| 12 | 155 22 5.5 | 4 43 43.0 | - 7 39.6 | +6 39 4.6 | -10 48.6 | 9.5530578 | 0.1069018 | 0.1124642 |
| 14 | 164 31 22.0 | 4 25 47.0 | 10 30.9 | 6 13 10.7 | 14 53.3 | 9.5668669 | 0.1176056 | 0.1223488 |
| 16 | 173 6 13.5 | 4 9 30.4 | 12 14.2 | 5 40 16.1 | 17 51.2 | 9.5803053 | 0.1267163 | 0.1307390 |
| 18 | 181 9 50.9 | 3 54 34.4 | 12 51.8 | 5 2 22.6 | 19 54.3 | 9.5931131 | 0.1344067 | 0.1377676 |
| 20 | 188 45 40.0 | 3 41 31.7 | 12 31.9 | 4 21 7.7 | 21 14.9 | 9.6051099 | 0.1408290 | 0.1436061 |
| 22 | 195 57 4.4 | 3 30 9.0 | -11 24.3 | +3 37 47.8 | -22 1.0 | 9.6161768 | 0.1461138 | 0.1483650 |
| 24 | 202 47 18.6 | 3 20 20.4 | 9 39.0 | 2 53 20.3 | 22 22.8 | 9.6262399 | 0.1503719 | 0.1521453 |
| 26 | 209 19 23.7 | 3 11 58.4 | 7 29.2 | 2 8 29.0 | 22 25.8 | 9.6352563 | 0.1536949 | 0.1550294 |
| 28 | 215 36 4.8 | 3 4 55.4 | 5 1.3 | 1 23 46.1 | 22 15.0 | 9.6432054 | 0.1561568 | 0.1570842 |
| 30 | 221 39 53.4 | 2 59 4.7 | - 2 24.7 | +0 39 35.7 | 21 53.9 | 9.6500798 | 0.1578179 | 0.1583629 |
| Nov. 1 | 227 33 7.7 | 2 54 30.1 | + 0 13.7 | -0 3 44.2 | -21 24.8 | 9.6558813 | 0.1587240 | 0.1589054 |
| 3 | 233 17 54.2 | 2 50 36.9 | 2 47.8 | 0 45 59.6 | 20 49.7 | 9.6606154 | 0.1589103 | 0.1587412 |
| 5 | 238 56 10.3 | 2 47 49.1 | 5 12.6 | 1 26 59.6 | 20 9.6 | 9.6642902 | 0.1584004 | 0.1578895 |
| 7 | 244 29 46.1 | 2 45 55.9 | 7 23.2 | 2 6 34.9 | 19 25.0 | 9.6669131 | 0.1572096 | 0.1563609 |
| 9 | 250 0 25.2 | 2 44 52.4 | 9 16.3 | 2 44 36.9 | 18 36.3 | 9.6684908 | 0.1553434 | 0.1541567 |
| 11 | 255 29 48.7 | 2 44 39.2 | +10 48.4 | -3 20 57.3 | -17 43.4 | 9.6690270 | 0.1527996 | 0.1512705 |
| 13 | 260 59 34.5 | 2 45 14.7 | 11 56.6 | 3 55 27.1 | 16 45.6 | 9.6685232 | 0.1495669 | 0.1476863 |
| 15 | 266 31 20.3 | 2 46 39.4 | 12 38.6 | 4 27 56.0 | 15 42.4 | 9.6669780 | 0.1456256 | 0.1433808 |
| 17 | 272 6 45.3 | 2 48 54.1 | 12 52.3 | 4 58 12.2 | 14 32.6 | 9.6643878 | 0.1409473 | 0.1383202 |
| 19 | 277 47 31.3 | 2 52 0.7 | 12 36.2 | 5 26 1.2 | 13 15.0 | 9.6607460 | 0.1354940 | 0.1324621 |
| 21 | 283 35 24.4 | 2 56 1.8 | +11 49.4 | -5 51 5.8 | -11 47.8 | 9.6560450 | 0.1292176 | 0.1257529 |
| 23 | 289 32 17.0 | 3 1 0.8 | 10 31.4 | 6 13 4.7 | 10 2.0 | 9.6502771 | 0.1220595 | 0.1181285 |
| 25 | 295 40 9.0 | 3 7 1.9 | 8 42.8 | 6 31 32.2 | 8 16.0 | 9.6434362 | 0.1139500 | 0.1095130 |
| 27 | 302 1 9.2 | 3 14 9.8 | 6 25.5 | 6 45 57.2 | 6 5.9 | 9.6352207 | 0.1045056 | 0.0996160 |
| 29 | 308 37 36.6 | 3 22 30.0 | 3 42.8 | 6 55 42.1 | 3 35.3 | 9.6265374 | 0.0945309 | 0.0889363 |
| Dec. 1 | 315 32 1.6 | 3 32 8.4 | + 0 40.5 | -7 0 2.4 | - 0 40.6 | 9.6165067 | 0.0830174 | 0.0767583 |
| 3 | 322 47 5.9 | 3 43 10.9 | - 2 33.2 | 6 58 6.0 | + 2 42.0 | 9.6054702 | 0.0701437 | 0.0631567 |
| 5 | 330 25 41.1 | 3 55 39.8 | 5 46.6 | 6 48 53.1 | 6 36.3 | 9.5935009 | 0.0557807 | 0.0479994 |
| 7 | 338 30 45.3 | 4 9 39.4 | 8 44.6 | 6 31 17.9 | 11 4.6 | 9.5807167 | 0.0397968 | 0.0311583 |
| 9 | 347 5 17.3 | 4 25 6.6 | 11 8.2 | 6 4 11.5 | 16 7.3 | 9.5672950 | 0.0220715 | 0.0125269 |
| 11 | 356 12 4.8 | 4 41 52.0 | -12 25.7 | -5 26 28.6 | +21 40.0 | 9.5534933 | 0.0025205 | 9.9920530 |
| 13 | 5 53 29.7 | 4 59 39.6 | 12 45.7 | 4 37 18.5 | 27 32.9 | 9.5396672 | 9.9811345 | 9.9697865 |
| 15 | 16 11 1.9 | 5 17 53.8 | 11 21.3 | 3 36 20.5 | 33 23.4 | 9.5262847 | 9.9580447 | 9.9459623 |
| 17 | 27 4 50.8 | 5 35 46.4 | 8 17.3 | 2 24 6.7 | 38 42.0 | 9.5139256 | 9.9336147 | 9.9211036 |
| 19 | 38 33 8.9 | 5 52 11.0 | - 3 46.5 | -1 2 22.2 | 43 46.4 | 9.5032560 | 9.9085602 | 9.8961489 |
| 21 | 50 31 42.2 | 6 5 46.8 | + 1 33.8 | +0 25 38.6 | +44 50.8 | 9.4949697 | 9.8840668 | 9.8725430 |
| 23 | 62 53 27.8 | 6 15 10.7 | 6 46.9 | 1 55 15.1 | 44 16.8 | 9.4896900 | 9.8618324 | 9.8522035 |
| 25 | 75 28 50.5 | 6 19 13.8 | 10 48.1 | 3 20 50.5 | 40 49.4 | 9.4878570 | 9.8439235 | 9.8372376 |
| 27 | 88 6 23.1 | 6 17 18.1 | 12 45.4 | 4 36 46.8 | 34 43.2 | 9.4896312 | 9.8323473 | 9.8293918 |
| 29 | 100 34 8.0 | 6 9 31.2 | 12 17.6 | 5 38 27.5 | 26 43.4 | 9.4948575 | 9.8284322 | 9.8294480 |
| 31 | 112 41 7.2 | 5 56 44.1 | + 9 39.0 | +6 23 5.5 | +17 51.2 | 9.5030990 | 9.8323381 | 9.8369381 |
| 33 | 124 18 38.1 | 5 40 17.9 | + 5 31.1 | +6 49 56.7 | + 9 5.4 | 9.5137350 | 9.8430375 | 9.8503997 |

| VENUS. | | | | | | | | | |
|----------------------|--|------------------|---------------------------|---------------------------|------------------|--------------------------------------|--------------------------------------|----------------------------|--|
| GREENWICH MEAN NOON. | | | | | | | | | |
| Date. | Heliocentric Longitude, Mean Equinox of Date. | Daily Motion. | Reduction to Orbit. | Heliocentric Latitude. | Daily Motion. | Logarithm of Radius Vector. | Logarithm of Distance from Earth— | | |
| | | | | | | | At Date. | At Inter- mediate Date. | |
| Jan. 1 | 117 49 28.7 | 1 37 24.4 | +3 0.1 | +2 16 39.2 | +4 16.6 | 9.8564333 | 9.5614632 | 9.5759595 | |
| 5 | 124 19 13.8 | 1 37 28.0 | 2 59.5 | 2 32 51.1 | 3 48.8 | 9.8563823 | 9.5904180 | 9.6047803 | |
| 9 | 130 49 11.6 | 1 37 30.6 | 2 49.7 | 2 47 5.5 | 3 17.8 | 9.8563685 | 9.6189998 | 9.6330416 | |
| 13 | 137 19 17.5 | 1 37 32.1 | 2 31.3 | 2 59 11.2 | 2 44.4 | 9.8563927 | 9.6468815 | 9.6605004 | |
| 17 | 143 49 26.6 | 1 37 32.2 | 2 5.0 | 3 8 58.6 | 2 8.9 | 9.8564544 | 9.6738820 | 9.6970189 | |
| 21 | 150 19 33.3 | 1 37 30.9 | +1 32.4 | +3 16 20.3 | +1 31.7 | 9.8565529 | 9.6999050 | 9.7125347 | |
| 25 | 156 49 32.3 | 1 37 28.3 | 0 55.1 | 3 21 10.7 | 0 53.4 | 9.8566886 | 9.7249062 | 9.7370177 | |
| 29 | 163 19 17.7 | 1 37 24.2 | +0 15.0 | 3 23 26.2 | +0 14.4 | 9.8568538 | 9.7488678 | 9.7604584 | |
| Feb. 2 | 169 48 44.4 | 1 37 18.8 | -0 26.0 | 3 23 5.4 | -0 24.7 | 9.8570524 | 9.7717915 | 9.7828697 | |
| 6 | 176 17 46.6 | 1 37 12.1 | 1 5.4 | 3 20 9.0 | 1 3.4 | 9.8572798 | 9.7936989 | 9.8042843 | |
| 10 | 182 46 19.5 | 1 37 4.2 | -1 41.4 | +3 14 39.7 | -1 41.0 | 9.8575329 | 9.8146325 | 9.8247506 | |
| 14 | 189 14 19.1 | 1 36 55.4 | 2 12.4 | 3 6 42.5 | 2 17.3 | 9.8578085 | 9.8346461 | 9.8443263 | |
| 18 | 195 41 41.4 | 1 36 45.6 | 2 36.6 | 2 56 23.9 | 2 51.6 | 9.8581029 | 9.8537978 | 9.8630672 | |
| 22 | 202 8 23.4 | 1 36 35.3 | 2 52.9 | 2 43 52.6 | 3 23.6 | 9.8584125 | 9.8721398 | 9.8810210 | |
| 26 | 206 34 23.0 | 1 36 24.7 | 3 0.4 | 2 29 18.5 | 3 22.9 | 9.8587331 | 9.8897147 | 9.8982250 | |
| Mar. 2 | 214 59 39.0 | 1 36 13.7 | -2 58.9 | +2 12 53.3 | -4 19.1 | 9.8590608 | 9.9065557 | 9.9147118 | |
| 6 | 221 24 11.0 | 1 36 2.6 | 2 48.5 | 1 54 49.9 | 4 42.0 | 9.8593914 | 9.9226960 | 9.9305140 | |
| 10 | 227 47 59.7 | 1 35 51.8 | 2 29.8 | 1 35 22.5 | 5 1.2 | 9.8597207 | 9.9381703 | 9.9456698 | |
| 14 | 234 11 6.1 | 1 35 41.5 | 2 3.5 | 1 14 45.7 | 5 16.6 | 9.8600447 | 9.9530179 | 9.9602197 | |
| 18 | 240 33 32.7 | 1 35 31.9 | 1 31.3 | 0 53 15.2 | 5 28.0 | 9.8603593 | 9.9672799 | 9.9742031 | |
| 22 | 246 55 22.3 | 1 35 23.0 | -0 54.7 | +0 31 7.1 | -5 35.4 | 9.8606607 | 9.9809927 | 9.9876527 | |
| 26 | 253 16 38.2 | 1 35 15.1 | -0 15.4 | +0 8 37.9 | 5 38.6 | 9.8609451 | 9.9941856 | 0.0005934 | |
| 30 | 259 37 24.4 | 1 35 8.2 | +0 24.6 | -0 13 56.0 | 5 37.7 | 9.8612093 | 0.0068788 | 0.0130433 | |
| Apr. 3 | 265 57 45.3 | 1 35 2.4 | 1 3.4 | 0 36 18.1 | 5 32.7 | 9.8614499 | 0.0190829 | 0.0250178 | |
| 7 | 272 17 45.3 | 1 34 57.8 | 1 39.1 | 0 58 12.2 | 5 23.7 | 9.8616641 | 0.0308319 | 0.0365344 | |
| 11 | 278 37 29.2 | 1 34 54.4 | +2 9.9 | -1 19 22.5 | -5 10.8 | 9.8618494 | 0.0421278 | 0.0476154 | |
| 15 | 284 57 1.7 | 1 34 52.1 | 2 34.3 | 1 39 33.8 | 4 54.2 | 9.8620036 | 0.0530001 | 0.0582841 | |
| 19 | 291 16 27.1 | 1 34 50.9 | 2 51.3 | 1 58 31.8 | 4 34.2 | 9.8621249 | 0.0634703 | 0.0685609 | |
| 23 | 297 35 50.1 | 1 34 50.8 | 2 50.9 | 2 16 2.7 | 4 10.8 | 9.8622118 | 0.0735570 | 0.0784606 | |
| 27 | 303 55 14.5 | 1 34 51.6 | 2 59.8 | 2 31 54.2 | 3 44.4 | 9.8622633 | 0.0832722 | 0.0879922 | |
| May 1 | 310 14 44.1 | 1 34 53.4 | +2 51.0 | -2 45 54.7 | -3 15.4 | 9.8622788 | 0.0926218 | 0.0971614 | |
| 5 | 316 34 22.3 | 1 34 55.9 | 2 33.8 | 2 57 54.2 | 2 44.0 | 9.8622583 | 0.1016120 | 0.1050746 | |
| 9 | 322 54 12.1 | 1 34 59.1 | 2 9.2 | 3 7 43.9 | 2 10.6 | 9.8622017 | 0.1102501 | 0.1144404 | |
| 13 | 329 14 15.9 | 1 35 2.9 | 1 38.3 | 3 15 16.6 | 1 35.6 | 9.8621100 | 0.1185470 | 0.1225723 | |
| 17 | 335 34 36.0 | 1 35 7.2 | 1 2.6 | 3 20 26.7 | 0 59.3 | 9.8619841 | 0.1265173 | 0.1303837 | |
| 21 | 341 55 14.0 | 1 35 11.9 | +0 23.8 | -3 23 10.1 | -0 22.7 | 9.8618257 | 0.1341722 | 0.1378840 | |
| 25 | 348 16 11.6 | 1 35 16.9 | -0 16.2 | 3 23 24.5 | +0 15.1 | 9.8616365 | 0.1415194 | 0.1450787 | |
| 29 | 354 37 29.8 | 1 35 22.2 | 0 55.4 | 3 21 9.3 | 0 52.4 | 9.8614188 | 0.1485621 | 0.1519692 | |
| June 2 | 0 59 9.5 | 1 35 27.7 | 1 31.9 | 3 16 25.8 | 1 22.2 | 9.8611751 | 0.1553003 | 0.1585553 | |
| 6 | 7 21 11.7 | 1 35 33.4 | 2 4.0 | 3 9 16.8 | 2 5.0 | 9.8609084 | 0.1617348 | 0.1648407 | |
| 10 | 13 43 37.1 | 1 35 39.3 | -2 30.0 | -2 59 47.4 | +2 39.4 | 9.8606220 | 0.1678721 | 0.1708311 | |
| 14 | 20 6 26.2 | 1 35 45.3 | 2 48.7 | 2 48 3.8 | 3 12.0 | 9.8603191 | 0.1737185 | 0.1765351 | |
| 18 | 26 29 39.7 | 1 35 51.5 | 2 59.0 | 2 34 14.3 | 3 42.3 | 9.8600037 | 0.1792826 | 0.1819611 | |
| 22 | 32 53 18.2 | 1 35 57.8 | 3 0.4 | 2 18 28.6 | 4 10.0 | 9.8596794 | 0.1845715 | 0.1871139 | |
| 26 | 39 17 22.5 | 1 36 4.3 | 2 52.9 | 2 0 58.0 | 4 34.7 | 9.8593504 | 0.1895882 | 0.1919941 | |
| 30 | 45 41 53.2 | 1 36 11.0 | -2 36.8 | -1 41 55.3 | +4 56.1 | 9.8590206 | 0.1943316 | 0.1966002 | |
| 34 | 52 6 50.9 | 1 36 17.9 | -2 12.8 | -1 21 34.3 | +5 13.6 | 9.8586942 | 0.1988003 | 0.2009323 | |

VENUS.

GREENWICH MEAN NOON.

| Date. | Heliocentric Longitude, Mean Equinox of Date. | Daily Motion. | Reduction to Orbit. | Heliocentric Latitude. | Daily Motion. | Logarithm of Radius Vector. | Logarithm of Distance from Earth— | |
|---------|---|---------------|---------------------|------------------------|---------------|-----------------------------|-----------------------------------|-----------------------|
| | | | | | | | At Date. | At Intermediate Date. |
| July 4 | 52° 6' 50.9" | 1° 36' 17.9" | -2° 12.8" | -1° 21' 34.3" | +5° 13.8" | 9.8586942 | 0.1988003 | 0.2009323 |
| 8 | 58 32 16.3 | 1 36 34.9 | 1 42.1 | 1 0 10.1 | 5 27.6 | 9.8583754 | 0.2029962 | 0.2049926 |
| 12 | 64 58 10.1 | 1 36 32.0 | 1 6.3 | 0 37 58.6 | 5 37.4 | 9.8580681 | 0.2069230 | 0.2087878 |
| 16 | 71 24 32.4 | 1 36 30.2 | -0 27.0 | -0 15 16.6 | 5 42.9 | 9.8577764 | 0.2105883 | 0.2123253 |
| 20 | 77 51 23.6 | 1 36 46.4 | +0 13.6 | +0 7 38.7 | 5 44.0 | 9.8575038 | 0.2139993 | 0.2156112 |
| 24 | 84 18 43.5 | 1 36 53.5 | 0 53.6 | 0 30 29.9 | +5 40.8 | 9.8572540 | 0.2171604 | 0.2186474 |
| 28 | 90 46 31.5 | 1 37 0.4 | 1 30.9 | 0 52 59.4 | 5 33.2 | 9.8570304 | 0.2200719 | 0.2214339 |
| Aug. 1 | 97 14 46.5 | 1 37 7.0 | 2 3.6 | 1 14 49.7 | 5 21.2 | 9.8568358 | 0.2227332 | 0.2239696 |
| 5 | 103 43 27.0 | 1 37 13.2 | 2 30.1 | 1 35 43.7 | 5 5.1 | 9.8566727 | 0.2251437 | 0.2262557 |
| 9 | 110 12 30.9 | 1 37 18.7 | 2 49.0 | 1 55 25.3 | 4 45.0 | 9.8565433 | 0.2273064 | 0.2282966 |
| 13 | 116 41 55.5 | 1 37 23.4 | +2 59.2 | +2 13 39.7 | +4 21.1 | 9.8564494 | 0.2292277 | 0.2301002 |
| 17 | 123 11 37.4 | 1 37 27.4 | 3 0.3 | 2 30 9.8 | 3 53.9 | 9.8563921 | 0.2309151 | 0.2316734 |
| 21 | 129 41 32.8 | 1 37 30.2 | 2 52.1 | 2 44 45.5 | 3 23.5 | 9.8563723 | 0.2323755 | 0.2330216 |
| 25 | 136 11 37.0 | 1 37 31.8 | 2 35.1 | 2 57 14.3 | 2 50.5 | 9.8563901 | 0.2336116 | 0.2341455 |
| 29 | 142 41 45.3 | 1 37 32.1 | 2 10.1 | 3 7 26.5 | 2 15.2 | 9.8564454 | 0.2346234 | 0.2350454 |
| Sept. 2 | 149 11 52.3 | 1 37 31.1 | +1 38.5 | +3 15 14.0 | +1 38.3 | 9.8565374 | 0.2354115 | 0.2357219 |
| 6 | 155 41 52.5 | 1 37 28.7 | 1 1.9 | 3 20 31.1 | 1 0.1 | 9.8566650 | 0.2359768 | 0.2361773 |
| 10 | 162 11 40.3 | 1 37 24.9 | +0 22.1 | 3 23 13.7 | +0 21.2 | 9.8568264 | 0.2363241 | 0.2364182 |
| 14 | 168 41 10.2 | 1 37 19.8 | -0 18.8 | 3 23 20.2 | -0 17.9 | 9.8570197 | 0.2364609 | 0.2364528 |
| 18 | 175 10 16.6 | 1 37 13.3 | 0 58.7 | 3 20 50.8 | 0 56.7 | 9.8572421 | 0.2363950 | 0.2362878 |
| 22 | 181 38 54.7 | 1 37 5.6 | -1 35.5 | +3 15 48.0 | -1 34.6 | 9.8574908 | 0.2361313 | 0.2359260 |
| 26 | 188 7 0.0 | 1 36 56.9 | 2 7.4 | 3 8 16.2 | 2 11.1 | 9.8577625 | 0.2356717 | 0.2353682 |
| 30 | 194 34 28.7 | 1 36 47.3 | 2 32.9 | 2 58 21.7 | 2 45.8 | 9.8580538 | 0.2350155 | 0.2346131 |
| Oct. 4 | 201 1 17.7 | 1 36 37.1 | 2 50.7 | 2 46 12.9 | 3 16.2 | 9.8583608 | 0.2341619 | 0.2336620 |
| 8 | 207 27 24.6 | 1 36 26.4 | 2 59.8 | 2 31 59.4 | 3 48.0 | 9.8586797 | 0.2331141 | 0.2325184 |
| 12 | 213 52 48.0 | 1 36 15.4 | -2 59.9 | +2 15 52.8 | -4 14.9 | 9.8590064 | 0.2318761 | 0.2311884 |
| 16 | 220 17 27.4 | 1 36 4.4 | 2 51.0 | 1 58 5.6 | 4 38.2 | 9.8593367 | 0.2304568 | 0.2296801 |
| 20 | 226 41 23.2 | 1 35 53.6 | 2 33.6 | 1 38 51.8 | 4 58.1 | 9.8596666 | 0.2288597 | 0.2279956 |
| 24 | 233 4 36.7 | 1 35 43.2 | 2 8.6 | 1 18 26.0 | 5 14.2 | 9.8599918 | 0.2270880 | 0.2261360 |
| 28 | 239 27 9.8 | 1 35 33.4 | 1 37.3 | 0 57 3.8 | 5 26.3 | 9.8603083 | 0.2251398 | 0.2240986 |
| Nov. 1 | 245 49 5.3 | 1 35 24.4 | -1 1.3 | +0 35 1.1 | -5 34.4 | 9.8606123 | 0.2230126 | 0.2218815 |
| 5 | 252 10 26.6 | 1 35 16.4 | -0 22.3 | +0 12 34.4 | 5 38.3 | 9.8609000 | 0.2207050 | 0.2194836 |
| 9 | 258 31 17.5 | 1 35 9.3 | +0 17.7 | -0 9 59.9 | 5 38.1 | 9.8611680 | 0.2182182 | 0.2169087 |
| 13 | 264 51 42.2 | 1 35 3.2 | 0 56.8 | 0 32 25.2 | 5 33.8 | 9.8614129 | 0.2155562 | 0.2141611 |
| 17 | 271 11 45.1 | 1 34 58.4 | 1 33.1 | 0 54 25.3 | 5 25.6 | 9.8616320 | 0.2127235 | 0.2112433 |
| 21 | 277 31 31.3 | 1 34 54.8 | +2 4.9 | -1 15 44.4 | -5 13.4 | 9.8618224 | 0.2097206 | 0.2081549 |
| 25 | 283 51 5.1 | 1 34 52.3 | 2 30.6 | 1 36 7.1 | 4 57.4 | 9.8619821 | 0.2065456 | 0.2048918 |
| 29 | 290 10 31.2 | 1 34 50.9 | 2 48.9 | 1 55 18.9 | 4 37.9 | 9.8621092 | 0.2031926 | 0.2014474 |
| Dec. 3 | 296 29 54.0 | 1 34 50.6 | 2 59.0 | 2 13 6.0 | 4 15.1 | 9.8622019 | 0.1996559 | 0.1978171 |
| 7 | 302 49 17.6 | 1 34 51.3 | 3 0.4 | 2 29 15.6 | 3 40.2 | 9.8622593 | 0.1959311 | 0.1930979 |
| 11 | 309 8 45.8 | 1 34 52.9 | +2 53.1 | -2 43 36.3 | -3 20.6 | 9.8622809 | 0.1920184 | 0.1899920 |
| 15 | 315 28 22.1 | 1 34 55.3 | 2 37.4 | 2 55 57.6 | 2 49.6 | 9.8622663 | 0.1879178 | 0.1857962 |
| 19 | 321 48 9.4 | 1 34 58.4 | 2 14.0 | 3 6 10.6 | 2 16.5 | 9.8622156 | 0.1836277 | 0.1814112 |
| 23 | 328 8 10.5 | 1 35 2.2 | 1 44.1 | 3 14 7.7 | 1 41.8 | 9.8621295 | 0.1791457 | 0.1768296 |
| 27 | 334 28 27.5 | 1 35 6.4 | 1 9.1 | 3 19 43.1 | 1 5.7 | 9.8620091 | 0.1744617 | 0.1720411 |
| 31 | 340 49 2.3 | 1 35 11.0 | +0 30.7 | -3 22 52.3 | -0 28.8 | 9.8618557 | 0.1695659 | 0.1670349 |
| 35 | 347 9 56.3 | 1 35 16.0 | -0 9.2 | -3 23 32.8 | +0 8.6 | 9.8616712 | 0.1644471 | 0.1618019 |

| MARS. | | | | | | | | |
|----------------------|---|---------------|---------------------|------------------------|---------------|-----------------------------|-----------------------------------|-----------------------|
| GREENWICH MEAN NOON. | | | | | | | | |
| Date. | Heliocentric Longitude, Mean Equinox of Date. | Daily Motion. | Reduction to Orbit. | Heliocentric Latitude. | Daily Motion. | Logarithm of Radius Vector. | Logarithm of Distance from Earth— | |
| | | | | | | | At Date. | At Intermediate Date. |
| Jan. 1 | 18 50 27.1 | 36 12.46 | -46.6 | 0 55 18.3 | +60.89 | 0.1512632 | 0.2063358 | 0.2100823 |
| 5 | 21 14 53.3 | 36 0.80 | 44.1 | 0 51 12.7 | 61.90 | 0.1524145 | 0.2138057 | 0.2175046 |
| 9 | 23 38 32.1 | 35 48.75 | 41.4 | 0 47 3.1 | 62.84 | 0.1536082 | 0.2211779 | 0.2248252 |
| 13 | 26 1 22.8 | 35 36.55 | 38.4 | 0 42 50.0 | 63.65 | 0.1548413 | 0.2284448 | 0.2320369 |
| 17 | 28 23 24.1 | 35 24.19 | 35.1 | 0 38 33.9 | 64.39 | 0.1561115 | 0.2356015 | 0.2391375 |
| 21 | 30 44 35.3 | 35 11.37 | -31.7 | -0 34 15.4 | +64.85 | 0.1574158 | 0.2426461 | 0.2461273 |
| 25 | 33 4 54.8 | 34 58.38 | 28.0 | 0 29 55.1 | 65.25 | 0.1587516 | 0.2495813 | 0.2530087 |
| 29 | 35 24 21.9 | 34 45.18 | 24.1 | 0 25 33.4 | 65.54 | 0.1601161 | 0.2564093 | 0.2597832 |
| Feb. 2 | 37 42 55.9 | 34 31.84 | 20.1 | 0 21 10.8 | 65.69 | 0.1615067 | 0.2631301 | 0.2664489 |
| 6 | 40 0 36.4 | 34 18.38 | 16.1 | 0 16 47.9 | 65.70 | 0.1629202 | 0.2697391 | 0.2730004 |
| 10 | 42 17 22.6 | 34 4.78 | -12.0 | -0 12 25.2 | +65.68 | 0.1643545 | 0.2762307 | 0.2794303 |
| 14 | 44 33 14.4 | 33 51.14 | 7.8 | 0 8 2.9 | 65.44 | 0.1658068 | 0.2825990 | 0.2857359 |
| 18 | 46 48 11.6 | 33 37.44 | - 3.6 | -0 3 41.7 | 65.13 | 0.1672744 | 0.2888415 | 0.2919161 |
| 22 | 49 2 13.9 | 33 23.74 | + 0.6 | +0 0 38.1 | 64.71 | 0.1687550 | 0.2949599 | 0.2979732 |
| 26 | 51 15 21.5 | 33 10.05 | 4.8 | 0 4 56.0 | 64.20 | 0.1702456 | 0.3009560 | 0.3039087 |
| Mar. 2 | 53 27 34.3 | 32 56.30 | + 8.9 | +0 9 11.7 | +63.61 | 0.1717443 | 0.3068309 | 0.3097217 |
| 6 | 55 38 52.6 | 32 42.77 | 12.9 | 0 13 24.9 | 62.94 | 0.1732485 | 0.3125814 | 0.3154084 |
| 10 | 57 49 16.5 | 32 29.17 | 16.7 | 0 17 35.2 | 62.16 | 0.1747557 | 0.3182024 | 0.3209626 |
| 14 | 59 58 46.1 | 32 15.69 | 20.6 | 0 21 42.2 | 61.31 | 0.1762641 | 0.3236889 | 0.3263808 |
| 18 | 62 7 22.1 | 32 2.35 | 24.3 | 0 25 45.7 | 60.39 | 0.1777710 | 0.3290384 | 0.3316619 |
| 22 | 64 15 5.0 | 31 49.11 | +27.8 | +0 29 45.3 | +59.40 | 0.1792744 | 0.3342517 | 0.3368079 |
| 26 | 66 21 55.2 | 31 36.04 | 31.2 | 0 33 40.9 | 58.35 | 0.1807722 | 0.3393311 | 0.3418215 |
| 30 | 68 27 53.5 | 31 23.14 | 34.3 | 0 37 32.1 | 57.24 | 0.1822627 | 0.3442786 | 0.3467024 |
| Apr. 3 | 70 33 0.5 | 31 10.37 | 37.2 | 0 41 18.8 | 56.07 | 0.1837439 | 0.3490925 | 0.3514482 |
| 7 | 72 37 16.7 | 30 57.76 | 39.9 | 0 45 0.7 | 54.85 | 0.1852139 | 0.3537686 | 0.3560537 |
| 11 | 74 40 42.9 | 30 45.39 | +42.5 | +0 48 37.6 | +53.57 | 0.1866711 | 0.3583027 | 0.3605155 |
| 15 | 76 43 20.1 | 30 33.94 | 44.7 | 0 52 9.3 | 52.26 | 0.1881134 | 0.3626918 | 0.3648322 |
| 19 | 78 45 9.1 | 30 21.34 | 46.7 | 0 55 35.7 | 50.91 | 0.1895396 | 0.3669369 | 0.3690062 |
| 23 | 80 46 11.1 | 30 9.84 | 48.5 | 0 58 56.6 | 49.52 | 0.1909475 | 0.3710401 | 0.3730395 |
| 27 | 82 46 26.5 | 29 58.16 | 50.0 | 1 2 11.9 | 48.11 | 0.1923365 | 0.3750039 | 0.3768337 |
| May 1 | 84 45 56.7 | 29 46.91 | +51.2 | +1 5 21.5 | +46.85 | 0.1937047 | 0.3788279 | 0.3806868 |
| 5 | 86 44 42.2 | 29 35.94 | 52.3 | 1 8 25.1 | 45.16 | 0.1950509 | 0.3825091 | 0.3842947 |
| 9 | 88 42 44.6 | 29 25.24 | 53.1 | 1 11 22.8 | 43.66 | 0.1963736 | 0.3860429 | 0.3877537 |
| 13 | 90 40 4.5 | 29 14.77 | 53.6 | 1 14 14.4 | 42.14 | 0.1976716 | 0.3894269 | 0.3910625 |
| 17 | 92 36 43.2 | 29 4.59 | 53.9 | 1 16 59.9 | 40.59 | 0.1989438 | 0.3926607 | 0.3942225 |
| 21 | 94 32 41.6 | 28 54.65 | +53.9 | +1 19 39.1 | +39.01 | 0.2001891 | 0.3957476 | 0.3972365 |
| 25 | 96 28 0.8 | 28 45.09 | 53.7 | 1 22 12.0 | 37.44 | 0.2014065 | 0.3986892 | 0.4001059 |
| 29 | 98 22 42.2 | 28 35.66 | 53.2 | 1 24 38.6 | 35.86 | 0.2025950 | 0.4014861 | 0.4028296 |
| June 2 | 100 16 46.5 | 28 26.59 | 52.5 | 1 26 58.9 | 34.25 | 0.2037534 | 0.4041356 | 0.4054037 |
| 6 | 102 10 15.3 | 28 17.81 | 51.5 | 1 29 12.6 | 32.63 | 0.2048813 | 0.4066339 | 0.4078251 |
| 10 | 104 3 9.4 | 28 9.39 | +50.4 | +1 31 19.9 | +31.01 | 0.2059776 | 0.4089777 | 0.4100914 |
| 14 | 105 55 30.3 | 28 1.11 | 49.0 | 1 33 20.7 | 29.30 | 0.2070413 | 0.4111665 | 0.4122032 |
| 18 | 107 47 18.7 | 27 53.18 | 47.5 | 1 35 15.0 | 27.76 | 0.2080719 | 0.4132022 | 0.4141631 |
| 22 | 109 38 36.1 | 27 45.59 | 45.8 | 1 37 2.8 | 26.19 | 0.2090683 | 0.4150866 | 0.4159727 |
| 26 | 111 29 23.8 | 27 36.30 | 43.8 | 1 38 44.0 | 24.49 | 0.2100305 | 0.4168210 | 0.4176314 |
| 30 | 113 19 42.9 | 27 31.30 | +41.7 | +1 40 18.7 | +22.85 | 0.2109575 | 0.4184030 | 0.4191354 |
| July 4 | 115 9 34.6 | 27 24.57 | +39.4 | +1 41 46.8 | +21.21 | 0.2118489 | 0.4198285 | 0.4204812 |

MARS.

GREENWICH MEAN NOON.

| Date. | Heliocentric Longitude, Mean Equinox of Date. | Daily Motion. | Reduction to Orbit. | Heliocentric Latitude. | Daily Motion. | Logarithm of Radius Vector. | Logarithm of Distance from Earth— | |
|---------|---|---------------|---------------------|------------------------|---------------|-----------------------------|-----------------------------------|-----------------------|
| | | | | | | | At Date. | At Intermediate Date. |
| July 4 | 115 9 34.6 | 27 24.57 | +39.4 | +1 41 46.8 | +21.21 | 0.2118489 | 0.4198285 | 0.4204812 |
| 8 | 116 58 59.9 | 27 18.14 | 37.0 | 1 43 8.4 | 19.57 | 0.2127038 | 0.4210937 | 0.4216658 |
| 12 | 118 48 0.1 | 27 12.00 | 34.5 | 1 44 23.4 | 17.94 | 0.2135218 | 0.4221976 | 0.4226891 |
| 16 | 120 36 36.3 | 27 6.17 | 31.9 | 1 45 31.9 | 16.31 | 0.2143027 | 0.4231407 | 0.4235529 |
| 20 | 122 24 49.9 | 27 0.66 | 29.1 | 1 46 33.9 | 14.69 | 0.2150458 | 0.4239255 | 0.4242587 |
| 24 | 124 12 42.0 | 26 55.45 | +26.1 | +1 47 29.4 | +13.05 | 0.2157507 | 0.4245523 | 0.4248060 |
| 28 | 126 0 13.9 | 26 50.54 | 23.1 | 1 48 18.3 | 11.43 | 0.2164169 | 0.4250192 | 0.4251918 |
| Aug. 1 | 127 47 26.7 | 26 45.91 | 20.0 | 1 49 0.8 | 9.82 | 0.2170444 | 0.4253225 | 0.4254107 |
| 5 | 129 34 21.6 | 26 41.56 | 16.8 | 1 49 36.9 | 8.21 | 0.2176326 | 0.4254570 | 0.4254602 |
| 9 | 131 20 59.6 | 26 37.50 | 13.6 | 1 50 6.5 | 6.60 | 0.2181812 | 0.4254212 | 0.4253391 |
| 13 | 133 7 22.0 | 26 33.79 | +10.4 | +1 50 29.7 | + 5.00 | 0.2186903 | 0.4252148 | 0.4250481 |
| 17 | 134 53 30.3 | 26 30.37 | 7.2 | 1 50 46.5 | 3.42 | 0.2191591 | 0.4248394 | 0.4245886 |
| 21 | 136 39 25.4 | 26 27.24 | 3.9 | 1 50 57.1 | 1.85 | 0.2195876 | 0.4242959 | 0.4239602 |
| 25 | 138 25 8.6 | 26 24.39 | + 0.6 | 1 51 1.3 | + 0.27 | 0.2199756 | 0.4235818 | 0.4231595 |
| 29 | 140 10 40.9 | 26 21.85 | - 2.7 | 1 50 59.3 | - 1.30 | 0.2203227 | 0.4226932 | 0.4221819 |
| Sept. 2 | 141 56 3.8 | 26 19.61 | - 6.0 | +1 50 50.9 | - 2.87 | 0.2206292 | 0.4216250 | 0.4210228 |
| 6 | 143 41 18.2 | 26 17.68 | 9.3 | 1 50 36.3 | 4.41 | 0.2208946 | 0.4203747 | 0.4196804 |
| 10 | 145 26 25.6 | 26 16.08 | 12.5 | 1 50 15.6 | 5.94 | 0.2211190 | 0.4189404 | 0.4181545 |
| 14 | 147 11 27.1 | 26 14.73 | 15.7 | 1 49 48.8 | 7.49 | 0.2213020 | 0.4173236 | 0.4164470 |
| 18 | 148 56 23.8 | 26 13.69 | 18.8 | 1 49 15.7 | 9.02 | 0.2214438 | 0.4155251 | 0.4145570 |
| 22 | 150 41 17.0 | 26 12.85 | -21.8 | +1 48 36.6 | -10.54 | 0.2215443 | 0.4135426 | 0.4124814 |
| 26 | 152 26 7.8 | 26 12.50 | 24.8 | 1 47 51.4 | 12.04 | 0.2216033 | 0.4113722 | 0.4102150 |
| 30 | 154 10 57.4 | 26 12.34 | 27.7 | 1 47 0.3 | 13.53 | 0.2216211 | 0.4090087 | 0.4077527 |
| Oct. 4 | 155 55 46.9 | 26 12.47 | 30.5 | 1 46 3.2 | 15.02 | 0.2215972 | 0.4064471 | 0.4050915 |
| 8 | 157 40 37.6 | 26 12.91 | 33.1 | 1 45 0.1 | 16.49 | 0.2215318 | 0.4036864 | 0.4022312 |
| 12 | 159 25 30.6 | 26 13.66 | -35.6 | +1 43 51.3 | -17.95 | 0.2214252 | 0.4007268 | 0.3991729 |
| 16 | 161 10 27.3 | 26 14.70 | 38.0 | 1 42 36.5 | 19.42 | 0.2212769 | 0.3975693 | 0.3959159 |
| 20 | 162 55 28.6 | 26 16.05 | 40.2 | 1 41 15.9 | 20.86 | 0.2210876 | 0.3942122 | 0.3924576 |
| 24 | 164 40 36.1 | 26 17.71 | 42.4 | 1 39 49.6 | 22.29 | 0.2208570 | 0.3906512 | 0.3887926 |
| 28 | 166 25 50.7 | 26 19.63 | 44.4 | 1 38 17.6 | 23.71 | 0.2205852 | 0.3868808 | 0.3849153 |
| Nov. 1 | 168 11 13.5 | 26 21.85 | -46.2 | +1 36 39.9 | -25.12 | 0.2202726 | 0.3828957 | 0.3808219 |
| 5 | 169 56 45.9 | 26 24.40 | 47.8 | 1 34 56.6 | 26.51 | 0.2199191 | 0.3786937 | 0.3765117 |
| 9 | 171 42 29.1 | 26 27.25 | 49.2 | 1 33 7.8 | 27.90 | 0.2195249 | 0.3742755 | 0.3719854 |
| 13 | 173 28 24.3 | 26 30.36 | 50.5 | 1 31 13.4 | 29.27 | 0.2190903 | 0.3696416 | 0.3672436 |
| 17 | 175 14 32.4 | 26 33.79 | 51.5 | 1 29 13.6 | 30.62 | 0.2186156 | 0.3647911 | 0.3622834 |
| 21 | 177 0 55.0 | 26 37.52 | -52.4 | +1 27 8.4 | -31.96 | 0.2181007 | 0.3597198 | 0.3570999 |
| 25 | 178 47 33.0 | 26 41.52 | 53.1 | 1 24 57.9 | 33.28 | 0.2175461 | 0.3544222 | 0.3516864 |
| 29 | 180 34 27.6 | 26 45.87 | 53.6 | 1 22 42.2 | 34.59 | 0.2169520 | 0.3488923 | 0.3460393 |
| Dec. 3 | 182 21 40.4 | 26 50.54 | 53.9 | 1 20 21.2 | 35.89 | 0.2163185 | 0.3431275 | 0.3401573 |
| 7 | 184 9 12.3 | 26 55.48 | 53.9 | 1 17 55.1 | 37.16 | 0.2156464 | 0.3371284 | 0.3340413 |
| 11 | 185 57 4.5 | 27 0.72 | -53.8 | +1 15 23.9 | -38.41 | 0.2149359 | 0.3308959 | 0.3276924 |
| 15 | 187 45 18.5 | 27 6.29 | 53.4 | 1 12 47.8 | 39.65 | 0.2141872 | 0.3244302 | 0.3211088 |
| 19 | 189 33 55.2 | 27 12.11 | 52.9 | 1 10 6.7 | 40.87 | 0.2134007 | 0.3177272 | 0.3142848 |
| 23 | 191 22 55.8 | 27 18.26 | 52.0 | 1 7 20.8 | 42.06 | 0.2125771 | 0.3107811 | 0.3072151 |
| 27 | 193 12 21.7 | 27 24.72 | 50.9 | 1 4 30.2 | 43.22 | 0.2117168 | 0.3035663 | 0.2998943 |
| 31 | 195 2 14.0 | 27 31.47 | -49.7 | +1 1 35.0 | -44.37 | 0.2108204 | 0.2961390 | 0.2923205 |
| 35 | 196 52 33.9 | 27 38.57 | -48.3 | +0 58 35.2 | -45.51 | 0.2098880 | | |

| JUPITER. | | | | | | | | | |
|----------------------|--|------------------|---------------------------|---------------------------|------------------|--------------------------------------|--------------------------------------|----------------------------|--|
| GREENWICH MEAN NOON. | | | | | | | | | |
| Date. | Heliocentric Longitude, Mean Equinox of Date. | Daily Motion. | Reduction to Orbit. | Heliocentric Latitude. | Daily Motion. | Logarithm of Radius Vector. | Logarithm of Distance from Earth— | | |
| | | | | | | | At Date. | At Inter- mediate Date. | |
| Jan. 1 | 320 50 16.6 | 5 18.80 | +26.9 | 0 52 7.8 | -5.45 | 0.7022067 | 0.7652953 | 0.7665476 | |
| 5 | 321 11 32.0 | 5 18.95 | 26.9 | 0 52 29.5 | 5.43 | 0.7021072 | 0.7677419 | 0.7688778 | |
| 9 | 321 32 48.1 | 5 19.09 | 27.0 | 0 52 51.1 | 5.40 | 0.7020081 | 0.7699547 | 0.7709722 | |
| 13 | 321 54 4.8 | 5 19.24 | 27.0 | 0 53 12.7 | 5.37 | 0.7019095 | 0.7719301 | 0.7728279 | |
| 17 | 322 15 22.0 | 5 19.39 | 27.1 | 0 53 34.1 | 5.34 | 0.7018113 | 0.7736656 | 0.7744431 | |
| 21 | 322 36 40.0 | 5 19.53 | +27.1 | -0 53 55.4 | -5.31 | 0.7017135 | 0.7751606 | 0.7758182 | |
| 25 | 322 57 58.3 | 5 19.67 | 27.1 | 0 54 16.6 | 5.28 | 0.7016163 | 0.7764158 | 0.7769536 | |
| 29 | 323 19 17.3 | 5 19.82 | 27.1 | 0 54 37.6 | 5.25 | 0.7015195 | 0.7774312 | 0.7778486 | |
| Feb. 2 | 323 40 36.8 | 5 19.96 | 27.2 | 0 54 58.5 | 5.22 | 0.7014232 | 0.7782055 | 0.7785018 | |
| 6 | 324 1 56.9 | 5 20.10 | 27.2 | 0 55 19.4 | 5.19 | 0.7013274 | 0.7787373 | 0.7789118 | |
| 10 | 324 23 17.6 | 5 20.24 | +27.2 | -0 55 40.1 | -5.16 | 0.7012321 | 0.7790254 | 0.7790779 | |
| 14 | 324 44 38.9 | 5 20.38 | 27.1 | 0 56 0.7 | 5.13 | 0.7011374 | 0.7790696 | 0.7790008 | |
| 18 | 325 6 0.7 | 5 20.53 | 27.1 | 0 56 21.1 | 5.10 | 0.7010431 | 0.7788717 | 0.7786824 | |
| 22 | 325 27 23.1 | 5 20.67 | 27.1 | 0 56 41.5 | 5.07 | 0.7009493 | 0.7784332 | 0.7781245 | |
| 26 | 325 48 46.0 | 5 20.81 | 27.1 | 0 57 1.7 | 5.04 | 0.7008560 | 0.7777564 | 0.7773289 | |
| Mar. 2 | 326 10 9.5 | 5 20.95 | +27.1 | -0 57 21.8 | -5.01 | 0.7007633 | 0.7768419 | 0.7762954 | |
| 6 | 326 31 33.6 | 5 21.08 | 27.0 | 0 57 41.8 | 4.98 | 0.7006711 | 0.7756896 | 0.7750243 | |
| 10 | 326 52 58.2 | 5 21.22 | 27.0 | 0 58 1.6 | 4.95 | 0.7005794 | 0.7743000 | 0.7735165 | |
| 14 | 327 14 23.3 | 5 21.35 | 27.0 | 0 58 21.4 | 4.92 | 0.7004883 | 0.7726743 | 0.7717740 | |
| 18 | 327 35 49.0 | 5 21.48 | 26.9 | 0 58 41.0 | 4.88 | 0.7003978 | 0.7708160 | 0.7698008 | |
| 22 | 327 57 15.2 | 5 21.62 | +26.9 | -0 59 0.4 | -4.85 | 0.7003078 | 0.7687288 | 0.7676002 | |
| 26 | 328 18 41.9 | 5 21.75 | 26.9 | 0 59 19.8 | 4.82 | 0.7002183 | 0.7664155 | 0.7651751 | |
| 30 | 328 40 9.2 | 5 21.89 | 26.8 | 0 59 39.0 | 4.79 | 0.7001294 | 0.7638790 | 0.7625275 | |
| Apr. 3 | 329 1 37.0 | 5 22.02 | 26.8 | 0 59 58.0 | 4.75 | 0.7000410 | 0.7611208 | 0.7596591 | |
| 7 | 329 23 5.4 | 5 22.15 | 26.7 | 1 0 17.0 | 4.72 | 0.6999532 | 0.7581420 | 0.7565726 | |
| 11 | 329 44 34.3 | 5 22.28 | +26.7 | -1 0 35.8 | -4.68 | 0.6998659 | 0.7549489 | 0.7532726 | |
| 15 | 330 6 3.7 | 5 22.41 | 26.6 | 1 0 54.5 | 4.65 | 0.6997793 | 0.7515444 | 0.7497651 | |
| 19 | 330 27 33.6 | 5 22.54 | 26.5 | 1 1 13.0 | 4.62 | 0.6996932 | 0.7479355 | 0.7460562 | |
| 23 | 330 49 4.0 | 5 22.66 | 26.4 | 1 1 31.4 | 4.58 | 0.6996077 | 0.7441279 | 0.7421512 | |
| 27 | 331 10 34.9 | 5 22.79 | 26.3 | 1 1 49.7 | 4.55 | 0.6995228 | 0.7401268 | 0.7380552 | |
| May 1 | 331 32 6.3 | 5 22.92 | +26.3 | -1 2 7.8 | -4.51 | 0.6994385 | 0.7359372 | 0.7337733 | |
| 5 | 331 53 38.2 | 5 23.04 | 26.2 | 1 2 25.8 | 4.48 | 0.6993548 | 0.7315645 | 0.7293119 | |
| 9 | 332 15 10.7 | 5 23.17 | 26.1 | 1 2 43.6 | 4.44 | 0.6992717 | 0.7270165 | 0.7246793 | |
| 13 | 332 36 43.6 | 5 23.30 | 26.0 | 1 3 1.3 | 4.41 | 0.6991891 | 0.7223020 | 0.7198863 | |
| 17 | 332 58 17.1 | 5 23.43 | 25.9 | 1 3 18.9 | 4.37 | 0.6991072 | 0.7174335 | 0.7149449 | |
| 21 | 333 19 51.0 | 5 23.55 | +25.8 | -1 3 36.3 | -4.34 | 0.6990260 | 0.7124219 | 0.7098656 | |
| 25 | 333 41 25.5 | 5 23.67 | 25.7 | 1 3 53.6 | 4.30 | 0.6989453 | 0.7072775 | 0.7046591 | |
| 29 | 334 3 0.4 | 5 23.79 | 25.6 | 1 4 10.7 | 4.26 | 0.6988653 | 0.7020119 | 0.6993373 | |
| June 2 | 334 24 35.7 | 5 23.91 | 25.5 | 1 4 27.7 | 4.23 | 0.6987860 | 0.6966375 | 0.6939146 | |
| 6 | 334 46 11.6 | 5 24.02 | 25.3 | 1 4 44.6 | 4.19 | 0.6987072 | 0.6911708 | 0.6884078 | |
| 10 | 335 7 47.9 | 5 24.14 | +25.2 | -1 5 1.2 | -4.16 | 0.6986291 | 0.6856287 | 0.6828361 | |
| 14 | 335 29 24.7 | 5 24.26 | 25.1 | 1 5 17.8 | 4.12 | 0.6985516 | 0.6800330 | 0.6772214 | |
| 18 | 335 51 2.0 | 5 24.38 | 25.0 | 1 5 34.2 | 4.08 | 0.6984747 | 0.6744043 | 0.6715843 | |
| 22 | 336 12 39.7 | 5 24.50 | 24.8 | 1 5 50.4 | 4.04 | 0.6983985 | 0.6687642 | 0.6659465 | |
| 26 | 336 34 18.0 | 5 24.61 | 24.7 | 1 6 6.6 | 4.01 | 0.6983229 | 0.6631344 | 0.6603307 | |
| 30 | 336 55 56.7 | 5 24.73 | +24.5 | -1 6 22.5 | -3.97 | 0.6982479 | 0.6575393 | 0.6547637 | |
| July 4 | 337 17 35.8 | 5 24.84 | +24.4 | -1 6 38.3 | -3.93 | 0.6981735 | 0.6520077 | 0.6492751 | |

JUPITER.

GREENWICH MEAN NOON.

| Date. | Heliocentric Longitude, Mean Equinox of Date. | | | Daily Motion. | Reduction to Orbit. | Heliocentric Latitude. | | | Daily Motion. | Logarithm of Radius Vector. | Logarithm of Distance from Earth— | |
|---------|---|----|------|---------------|---------------------|------------------------|----|------|---------------|-----------------------------|-----------------------------------|-----------------------|
| | ° | ' | " | | | ° | ' | " | | | At Date. | At Intermediate Date. |
| July 4 | 337 | 17 | 35.8 | 5 24.84 | +24.4 | -1 | 6 | 38.3 | -3.93 | 0.6981735 | 0.6520077 | 0.6492751 |
| 8 | 337 | 39 | 15.4 | 5 24.95 | 24.2 | 1 | 6 | 53.9 | 3.89 | 0.6980998 | 0.6465701 | 0.6438970 |
| 12 | 338 | 0 | 55.4 | 5 25.05 | 24.1 | 1 | 7 | 9.4 | 3.85 | 0.6980267 | 0.6412601 | 0.6386635 |
| 16 | 338 | 22 | 35.8 | 5 25.16 | 23.9 | 1 | 7 | 24.8 | 3.81 | 0.6979543 | 0.6361112 | 0.6336073 |
| 20 | 338 | 44 | 16.7 | 5 25.27 | 23.8 | 1 | 7 | 40.0 | 3.77 | 0.6978826 | 0.6311558 | 0.6287609 |
| 24 | 339 | 5 | 58.0 | 5 25.38 | +23.6 | -1 | 7 | 54.9 | -3.73 | 0.6978115 | 0.6264269 | 0.6241579 |
| 28 | 339 | 27 | 39.7 | 5 25.49 | 23.4 | 1 | 8 | 9.8 | 3.70 | 0.6977410 | 0.6219587 | 0.6198337 |
| Aug. 1 | 339 | 49 | 21.9 | 5 25.60 | 23.2 | 1 | 8 | 21.5 | 3.66 | 0.6976712 | 0.6177877 | 0.6158256 |
| 5 | 340 | 11 | 4.5 | 5 25.70 | 23.1 | 1 | 8 | 39.1 | 3.62 | 0.6976021 | 0.6139518 | 0.6121708 |
| 9 | 340 | 32 | 47.5 | 5 25.80 | 22.9 | 1 | 8 | 53.5 | 3.58 | 0.6975337 | 0.6104866 | 0.6089035 |
| 13 | 340 | 54 | 30.9 | 5 25.90 | +22.7 | -1 | 9 | 7.7 | -3.54 | 0.6974659 | 0.6074248 | 0.6060544 |
| 17 | 341 | 16 | 14.7 | 5 26.00 | 22.5 | 1 | 9 | 21.8 | 3.50 | 0.6973988 | 0.6047950 | 0.6036500 |
| 21 | 341 | 37 | 58.9 | 5 26.10 | 22.3 | 1 | 9 | 35.7 | 3.46 | 0.6973325 | 0.6026219 | 0.6017134 |
| 25 | 341 | 59 | 43.5 | 5 26.20 | 22.1 | 1 | 9 | 49.4 | 3.41 | 0.6972668 | 0.6009271 | 0.6002660 |
| 29 | 342 | 21 | 28.5 | 5 26.30 | 21.9 | 1 | 10 | 3.0 | 3.37 | 0.6972018 | 0.5997316 | 0.5993263 |
| Sept. 2 | 342 | 43 | 13.9 | 5 26.40 | +21.7 | -1 | 10 | 16.4 | -3.33 | 0.6971375 | 0.5990511 | 0.5989078 |
| 6 | 343 | 4 | 59.7 | 5 26.50 | 21.5 | 1 | 10 | 29.7 | 3.29 | 0.6970739 | 0.5988962 | 0.5990168 |
| 10 | 343 | 26 | 45.9 | 5 26.60 | 21.3 | 1 | 10 | 42.7 | 3.25 | 0.6970109 | 0.5992688 | 0.5996519 |
| 14 | 343 | 48 | 32.5 | 5 26.69 | 21.1 | 1 | 10 | 55.7 | 3.21 | 0.6969487 | 0.6001645 | 0.6008054 |
| 18 | 344 | 10 | 19.5 | 5 26.78 | 20.9 | 1 | 11 | 8.4 | 3.17 | 0.6968871 | 0.6015725 | 0.6024644 |
| 22 | 344 | 32 | 6.8 | 5 26.87 | +20.7 | -1 | 11 | 21.0 | -3.12 | 0.6968263 | 0.6034784 | 0.6046128 |
| 26 | 344 | 53 | 54.5 | 5 26.96 | 20.4 | 1 | 11 | 33.4 | 3.08 | 0.6967662 | 0.6058647 | 0.6072314 |
| 30 | 345 | 15 | 42.5 | 5 27.05 | 20.2 | 1 | 11 | 45.7 | 3.04 | 0.6967068 | 0.6087098 | 0.6102975 |
| Oct. 4 | 345 | 37 | 30.9 | 5 27.14 | 20.0 | 1 | 11 | 57.7 | 3.00 | 0.6966482 | 0.6119896 | 0.6137818 |
| 8 | 345 | 59 | 19.6 | 5 27.23 | 19.7 | 1 | 12 | 9.6 | 2.95 | 0.6965903 | 0.6156697 | 0.6176492 |
| 12 | 346 | 21 | 8.7 | 5 27.32 | +19.5 | -1 | 12 | 21.4 | -2.91 | 0.6965331 | 0.6197153 | 0.6218634 |
| 16 | 346 | 42 | 58.2 | 5 27.41 | 19.3 | 1 | 12 | 32.9 | 2.87 | 0.6964767 | 0.6240889 | 0.6263873 |
| 20 | 347 | 4 | 46.0 | 5 27.49 | 19.0 | 1 | 12 | 44.3 | 2.83 | 0.6964210 | 0.6287541 | 0.6311849 |
| 24 | 347 | 26 | 38.1 | 5 27.58 | 18.8 | 1 | 12 | 55.6 | 2.78 | 0.6963660 | 0.6336754 | 0.6362212 |
| 28 | 347 | 48 | 28.6 | 5 27.66 | 18.5 | 1 | 13 | 6.6 | 2.74 | 0.6963119 | 0.6388178 | 0.6414607 |
| Nov. 1 | 348 | 10 | 19.5 | 5 27.74 | +18.3 | -1 | 13 | 17.5 | -2.70 | 0.6962586 | 0.6441452 | 0.6468667 |
| 5 | 348 | 32 | 10.6 | 5 27.82 | 18.0 | 1 | 13 | 28.2 | 2.65 | 0.6962060 | 0.6496205 | 0.6524019 |
| 9 | 348 | 54 | 2.0 | 5 27.90 | 17.8 | 1 | 13 | 39.7 | 2.61 | 0.6961542 | 0.6552068 | 0.6580306 |
| 13 | 349 | 15 | 53.8 | 5 27.98 | 17.5 | 1 | 13 | 49.0 | 2.56 | 0.6961031 | 0.6608698 | 0.6637202 |
| 17 | 349 | 37 | 45.9 | 5 28.05 | 17.2 | 1 | 13 | 59.2 | 2.52 | 0.6960528 | 0.6665788 | 0.6694422 |
| 21 | 349 | 59 | 38.2 | 5 28.13 | +17.0 | -1 | 14 | 9.2 | -2.48 | 0.6960032 | 0.6723069 | 0.6751691 |
| 25 | 350 | 21 | 30.9 | 5 28.21 | 16.7 | 1 | 14 | 19.0 | 2.43 | 0.6959543 | 0.6780262 | 0.6808755 |
| 29 | 350 | 43 | 23.9 | 5 28.29 | 16.4 | 1 | 14 | 28.6 | 2.39 | 0.6959062 | 0.6837138 | 0.6865377 |
| Dec. 3 | 351 | 5 | 17.2 | 5 28.36 | 16.1 | 1 | 14 | 38.1 | 2.34 | 0.6958589 | 0.6893444 | 0.6921307 |
| 7 | 351 | 27 | 10.8 | 5 28.43 | 15.9 | 1 | 14 | 47.4 | 2.30 | 0.6958121 | 0.6948943 | 0.6976323 |
| 11 | 351 | 49 | 4.7 | 5 28.50 | +15.6 | -1 | 14 | 56.5 | -2.25 | 0.6957661 | 0.7003429 | 0.7030237 |
| 15 | 352 | 10 | 58.8 | 5 28.56 | 15.3 | 1 | 15 | 5.4 | 2.21 | 0.6957209 | 0.7056732 | 0.7082894 |
| 19 | 352 | 32 | 53.2 | 5 28.63 | 15.0 | 1 | 15 | 14.1 | 2.16 | 0.6956765 | 0.7108708 | 0.7134159 |
| 23 | 352 | 54 | 47.8 | 5 28.70 | 14.7 | 1 | 15 | 22.7 | 2.12 | 0.6956327 | 0.7159229 | 0.7183901 |
| 27 | 353 | 16 | 42.8 | 5 28.76 | 14.4 | 1 | 15 | 31.0 | 2.07 | 0.6955897 | 0.7208161 | 0.7231993 |
| 31 | 353 | 38 | 38.0 | 5 28.83 | +14.1 | -1 | 15 | 39.2 | -2.02 | 0.6955475 | 0.7255382 | 0.7278311 |
| 35 | 354 | 0 | 33.4 | 5 28.89 | +13.8 | -1 | 15 | 47.2 | -1.98 | 0.6955061 | | |

| SATURN. | | | | | | | | | |
|----------------------|--|------------------|---------------------------|---------------------------|------------------|--------------------------------------|--------------------------------------|----------------------------|--|
| GREENWICH MEAN NOON. | | | | | | | | | |
| Date. | Heliocentric Longitude, Mean Equinox of Date. | Daily Motion. | Reduction to Orbit. | Heliocentric Latitude. | Daily Motion. | Logarithm of Radius Vector. | Logarithm of Distance from Earth— | | |
| | | | | | | | At Date. | At Interme- diate Date. | |
| Jan. 1 | 161 38 2.2 | 2 5.50 | +1 36.7 | +1 52 41.2 | +3.58 | 0.9703060 | 0.9494387 | 0.9479678 | |
| 5 | 161 46 24.2 | 2 5.47 | 1 36.7 | 1 52 55.6 | 3.57 | 0.9703591 | 0.9465150 | 0.9450859 | |
| 9 | 161 54 46.1 | 2 5.44 | 1 36.6 | 1 53 9.8 | 3.56 | 0.9704122 | 0.9436818 | 0.9423051 | |
| 13 | 162 3 7.8 | 2 5.41 | 1 36.5 | 1 53 24.1 | 3.55 | 0.9704653 | 0.9409579 | 0.9396426 | |
| 17 | 162 11 29.4 | 2 5.38 | 1 36.5 | 1 53 38.2 | 3.54 | 0.9705165 | 0.9383615 | 0.9371166 | |
| 21 | 162 19 50.8 | 2 5.35 | +1 36.4 | +1 53 52.4 | +3.53 | 0.9705717 | 0.9359100 | 0.9347436 | |
| 25 | 162 28 12.3 | 2 5.32 | 1 36.3 | 1 54 6.5 | 3.52 | 0.9706249 | 0.9336195 | 0.9325393 | |
| 29 | 162 36 33.5 | 2 5.29 | 1 36.2 | 1 54 20.5 | 3.51 | 0.9706781 | 0.9315051 | 0.9305186 | |
| Feb. 2 | 162 44 54.6 | 2 5.26 | 1 36.1 | 1 54 34.5 | 3.50 | 0.9707314 | 0.9295820 | 0.9286971 | |
| 6 | 162 53 15.6 | 2 5.23 | 1 36.0 | 1 54 48.5 | 3.49 | 0.9707848 | 0.9278656 | 0.9270891 | |
| 10 | 163 1 36.6 | 2 5.20 | +1 35.9 | +1 55 2.4 | +3.47 | 0.9708381 | 0.9263692 | 0.9257077 | |
| 14 | 163 9 57.3 | 2 5.17 | 1 35.9 | 1 55 16.4 | 3.46 | 0.9708915 | 0.9251054 | 0.9245637 | |
| 18 | 163 18 17.9 | 2 5.14 | 1 35.8 | 1 55 30.2 | 3.45 | 0.9709450 | 0.9240832 | 0.9236648 | |
| 22 | 163 26 38.4 | 2 5.11 | 1 35.7 | 1 55 44.0 | 3.44 | 0.9709985 | 0.9233093 | 0.9230174 | |
| 26 | 163 34 58.9 | 2 5.08 | 1 35.6 | 1 55 57.7 | 3.43 | 0.9710519 | 0.9227895 | 0.9226258 | |
| Mar. 2 | 163 43 19.1 | 2 5.05 | +1 35.5 | +1 56 11.4 | +3.42 | 0.9711055 | 0.9224266 | 0.9224926 | |
| 6 | 163 51 39.3 | 2 5.02 | 1 35.4 | 1 56 25.1 | 3.41 | 0.9711590 | 0.9225235 | 0.9226198 | |
| 10 | 163 59 59.3 | 2 4.99 | 1 35.3 | 1 56 38.7 | 3.40 | 0.9712126 | 0.9227809 | 0.9230068 | |
| 14 | 164 8 19.2 | 2 4.96 | 1 35.2 | 1 56 52.2 | 3.39 | 0.9712663 | 0.9232965 | 0.9236500 | |
| 18 | 164 16 39.0 | 2 4.93 | 1 35.0 | 1 57 5.8 | 3.37 | 0.9713200 | 0.9240658 | 0.9245428 | |
| 22 | 164 24 58.7 | 2 4.89 | +1 34.9 | +1 57 19.2 | +3.36 | 0.9713738 | 0.9250800 | 0.9256763 | |
| 26 | 164 33 18.2 | 2 4.86 | 1 34.8 | 1 57 32.7 | 3.35 | 0.9714275 | 0.9263305 | 0.9270411 | |
| 30 | 164 41 37.6 | 2 4.83 | 1 34.7 | 1 57 46.1 | 3.34 | 0.9714813 | 0.9278071 | 0.9286271 | |
| Apr. 3 | 164 49 56.8 | 2 4.80 | 1 34.6 | 1 57 59.5 | 3.33 | 0.9715352 | 0.9294996 | 0.9304232 | |
| 7 | 164 58 16.0 | 2 4.77 | 1 34.5 | 1 58 12.8 | 3.32 | 0.9715890 | 0.9313961 | 0.9324163 | |
| 11 | 165 6 35.0 | 2 4.74 | +1 34.3 | +1 58 26.0 | +3.31 | 0.9716429 | 0.9334822 | 0.9345918 | |
| 15 | 165 14 54.0 | 2 4.71 | 1 34.2 | 1 58 39.2 | 3.30 | 0.9716969 | 0.9357429 | 0.9369331 | |
| 19 | 165 23 12.8 | 2 4.68 | 1 34.1 | 1 58 52.4 | 3.29 | 0.9717508 | 0.9381606 | 0.9394235 | |
| 23 | 165 31 31.5 | 2 4.65 | 1 34.0 | 1 59 5.6 | 3.27 | 0.9718048 | 0.9407195 | 0.9420469 | |
| 27 | 165 39 50.0 | 2 4.62 | 1 33.9 | 1 59 18.6 | 3.26 | 0.9718589 | 0.9434036 | 0.9447875 | |
| May 1 | 165 48 8.4 | 2 4.59 | +1 33.7 | +1 59 31.7 | +3.25 | 0.9719129 | 0.9461968 | 0.9476297 | |
| 5 | 165 56 26.8 | 2 4.56 | 1 33.6 | 1 59 44.6 | 3.24 | 0.9719671 | 0.9490839 | 0.9505575 | |
| 9 | 166 4 45.0 | 2 4.53 | 1 33.5 | 1 59 57.6 | 3.23 | 0.9720212 | 0.9520483 | 0.9535543 | |
| 13 | 166 13 3.0 | 2 4.50 | 1 33.3 | 2 0 10.5 | 3.22 | 0.9720753 | 0.9550733 | 0.9566031 | |
| 17 | 166 21 21.0 | 2 4.47 | 1 33.2 | 2 0 23.3 | 3.21 | 0.9721295 | 0.9581420 | 0.9596879 | |
| 21 | 166 29 38.8 | 2 4.43 | +1 33.1 | +2 0 36.1 | +3.20 | 0.9721837 | 0.9612392 | 0.9627940 | |
| 25 | 166 37 56.4 | 2 4.40 | 1 32.9 | 2 0 48.9 | 3.18 | 0.9722380 | 0.9643507 | 0.9659076 | |
| 29 | 166 46 14.0 | 2 4.37 | 1 32.7 | 2 1 1.6 | 3.17 | 0.9722923 | 0.9674633 | 0.9690160 | |
| June 2 | 166 54 31.4 | 2 4.34 | 1 32.6 | 2 1 14.3 | 3.16 | 0.9723466 | 0.9705643 | 0.9721067 | |
| 6 | 167 2 48.7 | 2 4.31 | 1 32.4 | 2 1 26.9 | 3.15 | 0.9724010 | 0.9736413 | 0.9751664 | |
| 10 | 167 11 6.0 | 2 4.28 | +1 32.3 | +2 1 39.5 | +3.14 | 0.9724554 | 0.9766806 | 0.9781827 | |
| 14 | 167 19 23.0 | 2 4.25 | 1 32.1 | 2 1 52.0 | 3.13 | 0.9725098 | 0.9796711 | 0.9811441 | |
| 18 | 167 27 40.0 | 2 4.22 | 1 32.0 | 2 2 4.5 | 3.12 | 0.9725642 | 0.9826010 | 0.9840403 | |
| 22 | 167 35 56.8 | 2 4.19 | 1 31.8 | 2 2 17.0 | 3.10 | 0.9726186 | 0.9854611 | 0.9868624 | |
| 26 | 167 44 13.5 | 2 4.16 | 1 31.6 | 2 2 29.4 | 3.09 | 0.9726731 | 0.9882433 | 0.9896026 | |
| 30 | 167 52 30.1 | 2 4.13 | +1 31.5 | +2 2 41.7 | +3.08 | 0.9727276 | 0.9909394 | 0.9922524 | |
| July 4 | 168 0 46.6 | 2 4.10 | +1 31.3 | +2 2 54.0 | +3.07 | 0.9727822 | 0.9935408 | 0.9948033 | |

SATURN.

GREENWICH MEAN NOON.

| Date. | Heliocentric Longitude, Mean Equinox of Date. | Daily Motion. | Reduction to Orbit. | Heliocentric Latitude. | Daily Motion. | Logarithm of Radius Vector. | Logarithm of Distance from Earth— | |
|---------|---|---------------|---------------------|------------------------|---------------|-----------------------------|-----------------------------------|-----------------------|
| | | | | | | | At Date. | At Intermediate Date. |
| July 4 | 168 0 46.6 | 2 4.10 | +1 31.3 | +2 2 54.0 | +3.07 | 0.9727822 | 0.9935408 | 0.9948033 |
| 8 | 168 9 2.9 | 2 4.07 | 1 31.2 | 2 3 6.3 | 2.06 | 0.9728367 | 0.9960392 | 0.9972474 |
| 12 | 168 17 19.2 | 2 4.03 | 1 31.0 | 2 3 18.5 | 3.05 | 0.9728913 | 0.9984260 | 0.9995772 |
| 16 | 168 25 35.2 | 2 4.00 | 1 30.8 | 2 3 30.7 | 3.04 | 0.9729459 | 1.0006976 | 1.0017872 |
| 20 | 168 33 51.2 | 2 3.97 | 1 30.6 | 2 3 42.8 | 3.02 | 0.9730006 | 1.0028458 | 1.0038727 |
| 24 | 168 42 7.0 | 2 3.94 | +1 30.5 | +2 3 54.9 | +3.01 | 0.9730552 | 1.0048673 | 1.0058288 |
| 28 | 168 50 22.7 | 2 3.91 | 1 30.3 | 2 4 6.9 | 3.00 | 0.9731099 | 1.0067570 | 1.0076512 |
| Aug. 1 | 168 58 38.3 | 2 3.88 | 1 30.1 | 2 4 18.9 | 2.99 | 0.9731646 | 1.0085106 | 1.0093344 |
| 5 | 169 6 53.8 | 2 3.85 | 1 30.0 | 2 4 30.8 | 2.98 | 0.9732193 | 1.0101224 | 1.0108740 |
| 9 | 169 15 9.2 | 2 3.82 | 1 29.8 | 2 4 42.7 | 2.97 | 0.9732741 | 1.0115898 | 1.0122650 |
| 13 | 169 23 24.4 | 2 3.79 | +1 29.6 | +2 4 54.6 | +2.96 | 0.9733289 | 1.0129055 | 1.0135073 |
| 17 | 169 31 39.5 | 2 3.76 | 1 29.4 | 2 5 6.4 | 2.94 | 0.9733837 | 1.0140708 | 1.0145958 |
| 21 | 169 39 54.5 | 2 3.73 | 1 29.2 | 2 5 18.1 | 2.93 | 0.9734385 | 1.0150823 | 1.0155300 |
| 25 | 169 48 9.3 | 2 3.70 | 1 29.0 | 2 5 29.8 | 2.92 | 0.9734934 | 1.0159387 | 1.0163076 |
| 29 | 169 56 24.0 | 2 3.66 | 1 28.8 | 2 5 41.5 | 2.91 | 0.9735483 | 1.0166367 | 1.0169256 |
| Sept. 2 | 170 4 38.7 | 2 3.63 | +1 28.6 | +2 5 53.1 | +2.90 | 0.9736032 | 1.0171742 | 1.0173821 |
| 6 | 170 12 53.2 | 2 3.60 | 1 28.4 | 2 6 4.7 | 2.89 | 0.9736581 | 1.0175490 | 1.0176751 |
| 10 | 170 21 7.6 | 2 3.57 | 1 28.2 | 2 6 16.2 | 2.87 | 0.9737131 | 1.0177602 | 1.0178042 |
| 14 | 170 29 21.8 | 2 3.54 | 1 28.0 | 2 6 27.7 | 2.86 | 0.9737680 | 1.0178072 | 1.0177696 |
| 18 | 170 37 35.9 | 2 3.51 | 1 27.8 | 2 6 39.1 | 2.85 | 0.9738229 | 1.0176910 | 1.0175716 |
| 22 | 170 45 49.9 | 2 3.48 | +1 27.6 | +2 6 50.5 | +2.84 | 0.9738780 | 1.0174112 | 1.0172099 |
| 26 | 170 54 3.8 | 2 3.45 | 1 27.4 | 2 7 1.8 | 2.83 | 0.9739330 | 1.0169678 | 1.0166845 |
| 30 | 171 2 17.5 | 2 3.42 | 1 27.2 | 2 7 13.1 | 2.82 | 0.9739880 | 1.0163602 | 1.0159949 |
| Oct. 4 | 171 10 31.2 | 2 3.39 | 1 27.0 | 2 7 24.3 | 2.80 | 0.9740430 | 1.0155887 | 1.0151421 |
| 8 | 171 18 44.7 | 2 3.36 | 1 26.8 | 2 7 35.5 | 2.79 | 0.9740981 | 1.0146553 | 1.0141281 |
| 12 | 171 26 58.1 | 2 3.33 | +1 26.6 | +2 7 46.7 | +2.76 | 0.9741532 | 1.0135614 | 1.0129555 |
| 16 | 171 35 11.3 | 2 3.30 | 1 26.4 | 2 7 57.8 | 2.77 | 0.9742084 | 1.0123107 | 1.0116274 |
| 20 | 171 43 24.4 | 2 3.26 | 1 26.1 | 2 8 8.9 | 2.76 | 0.9742634 | 1.0109057 | 1.0101461 |
| 24 | 171 51 37.4 | 2 3.23 | 1 25.9 | 2 8 19.9 | 2.75 | 0.9743186 | 1.0093489 | 1.0085143 |
| 28 | 171 59 50.4 | 2 3.20 | 1 25.7 | 2 8 30.9 | 2.73 | 0.9743738 | 1.0076428 | 1.0067349 |
| Nov. 1 | 172 8 3.2 | 2 3.17 | +1 25.5 | +2 8 41.8 | +2.72 | 0.9744289 | 1.0057911 | 1.0048120 |
| 5 | 172 16 15.8 | 2 3.14 | 1 25.2 | 2 8 52.7 | 2.71 | 0.9744841 | 1.0037985 | 1.0027512 |
| 9 | 172 24 28.3 | 2 3.11 | 1 25.0 | 2 9 3.5 | 2.70 | 0.9745393 | 1.0016712 | 1.0005591 |
| 13 | 172 32 40.7 | 2 3.08 | 1 24.8 | 2 9 14.3 | 2.69 | 0.9745945 | 0.9994157 | 0.9982420 |
| 17 | 172 40 52.9 | 2 3.05 | 1 24.5 | 2 9 25.1 | 2.68 | 0.9746498 | 0.9970387 | 0.9958066 |
| 21 | 172 49 5.1 | 2 3.02 | +1 24.3 | +2 9 35.7 | +2.66 | 0.9747051 | 0.9945468 | 0.9932598 |
| 25 | 172 57 17.2 | 2 2.99 | 1 24.1 | 2 9 46.4 | 2.65 | 0.9747604 | 0.9919469 | 0.9906089 |
| 29 | 173 5 29.1 | 2 2.96 | 1 23.8 | 2 9 57.0 | 2.64 | 0.9748156 | 0.9892472 | 0.9878629 |
| Dec. 3 | 173 13 40.8 | 2 2.93 | 1 23.6 | 2 10 7.5 | 2.63 | 0.9748709 | 0.9864573 | 0.9850323 |
| 7 | 173 21 52.5 | 2 2.89 | 1 23.3 | 2 10 18.0 | 2.62 | 0.9749262 | 0.9835889 | 0.9821288 |
| 11 | 173 30 4.0 | 2 2.86 | +1 23.1 | +2 10 28.4 | +2.61 | 0.9749815 | 0.9806534 | 0.9791642 |
| 15 | 173 38 15.4 | 2 2.83 | 1 22.8 | 2 10 38.8 | 2.59 | 0.9750368 | 0.9776627 | 0.9761503 |
| 19 | 173 46 26.7 | 2 2.80 | 1 22.6 | 2 10 49.2 | 2.58 | 0.9750921 | 0.9746286 | 0.9730990 |
| 23 | 173 54 37.8 | 2 2.77 | 1 22.4 | 2 10 59.5 | 2.57 | 0.9751475 | 0.9715636 | 0.9700238 |
| 27 | 174 2 48.8 | 2 2.74 | 1 22.1 | 2 11 9.8 | 2.56 | 0.9752029 | 0.9684816 | 0.9669386 |
| 31 | 174 10 59.7 | 2 2.71 | +1 21.9 | +2 11 20.0 | +2.55 | 0.9752582 | 0.9653374 | 0.9638599 |
| 35 | 174 19 10.5 | 2 2.68 | +1 21.6 | +2 11 30.1 | +2.54 | 0.9753136 | | |

| URANUS. | | | | | | | | | |
|----------------------|---|---------------|---------------------|------------------------|---------------|----------------------------|-----------------------------------|-----------------------|--|
| GREENWICH MEAN NOON. | | | | | | | | | |
| Date. | Heliocentric Longitude, Mean Equinox of Date. | Daily Motion. | Reduction to Orbit. | Heliocentric Latitude. | Daily Motion. | Logarithm of Radia Vector. | Logarithm of Distance from Earth— | | |
| | | | | | | | At Date. | At Intermediate Date. | |
| Jan. 1 | 208 0 45.7 | 45.67 | -9.4 | +0 33 4.4 | -0.43 | 1.2664400 | 1.2737543 | 1.2722436 | |
| 9 | 208 6 51.0 | 45.66 | 9.4 | 0 33 0.9 | 0.43 | 1.2664612 | 1.2706968 | 1.2691213 | |
| 17 | 208 12 56.3 | 45.66 | 9.4 | 0 32 57.5 | 0.43 | 1.2664825 | 1.2675247 | 1.2659147 | |
| 25 | 208 19 1.5 | 45.65 | 9.4 | 0 32 54.0 | 0.43 | 1.2665039 | 1.2642930 | 1.2626850 | |
| Feb. 2 | 208 25 6.7 | 45.64 | 9.4 | 0 32 50.5 | 0.43 | 1.2665253 | 1.2610803 | 1.2594929 | |
| 10 | 208 31 11.8 | 45.64 | -9.4 | +0 32 47.0 | -0.44 | 1.2665468 | 1.2579315 | 1.2564048 | |
| 18 | 208 37 16.9 | 45.63 | 9.4 | 0 32 43.5 | 0.44 | 1.2665683 | 1.2549213 | 1.2534886 | |
| 26 | 208 43 22.0 | 45.63 | 9.4 | 0 32 40.0 | 0.44 | 1.2665899 | 1.2521140 | 1.2508047 | |
| Mar. 6 | 208 49 27.0 | 45.62 | 9.4 | 0 32 36.5 | 0.44 | 1.2666115 | 1.2495683 | 1.2484122 | |
| 14 | 208 55 32.0 | 45.62 | 9.4 | 0 32 33.0 | 0.44 | 1.2666332 | 1.2473433 | 1.2463680 | |
| 22 | 209 1 36.9 | 45.61 | -9.4 | +0 32 29.5 | -0.44 | 1.2666549 | 1.2454915 | 1.2447183 | |
| 30 | 209 7 41.8 | 45.61 | 9.4 | 0 32 26.0 | 0.44 | 1.2666767 | 1.2440524 | 1.2434980 | |
| Apr. 7 | 209 13 46.6 | 45.60 | 9.4 | 0 32 22.5 | 0.44 | 1.2666985 | 1.2430585 | 1.2427367 | |
| 15 | 209 19 51.4 | 45.60 | 9.4 | 0 32 19.0 | 0.44 | 1.2667204 | 1.2425344 | 1.2424522 | |
| 23 | 209 25 56.1 | 45.59 | 9.4 | 0 32 15.4 | 0.44 | 1.2667424 | 1.2424895 | 1.2426455 | |
| May 1 | 209 32 0.8 | 45.59 | -9.4 | +0 32 11.9 | -0.44 | 1.2667644 | 1.2429192 | 1.2433093 | |
| 9 | 209 38 5.5 | 45.58 | 9.4 | 0 32 8.4 | 0.44 | 1.2667864 | 1.2438134 | 1.2444282 | |
| 17 | 209 44 10.1 | 45.58 | 9.4 | 0 32 4.8 | 0.44 | 1.2668085 | 1.2451495 | 1.2459721 | |
| 25 | 209 50 14.7 | 45.57 | 9.4 | 0 32 1.3 | 0.44 | 1.2668307 | 1.2468909 | 1.2479008 | |
| June 2 | 209 56 19.2 | 45.56 | 9.4 | 0 31 57.7 | 0.45 | 1.2668529 | 1.2489966 | 1.2501721 | |
| 10 | 210 2 23.7 | 45.56 | -9.4 | +0 31 54.1 | -0.45 | 1.2668751 | 1.2514211 | 1.2527359 | |
| 18 | 210 8 28.2 | 45.55 | 9.4 | 0 31 50.6 | 0.45 | 1.2668974 | 1.2541093 | 1.2555340 | |
| 26 | 210 14 32.6 | 45.55 | 9.4 | 0 31 47.0 | 0.45 | 1.2669198 | 1.2570032 | 1.2585099 | |
| July 4 | 210 20 36.9 | 45.54 | 9.3 | 0 31 43.4 | 0.45 | 1.2669422 | 1.2600472 | 1.2616076 | |
| 12 | 210 26 41.2 | 45.54 | 9.3 | 0 31 39.8 | 0.45 | 1.2669647 | 1.2631833 | 1.2647664 | |
| 20 | 210 32 45.5 | 45.53 | -9.3 | +0 31 36.2 | -0.45 | 1.2669872 | 1.2663505 | 1.2679285 | |
| 28 | 210 38 49.7 | 45.52 | 9.3 | 0 31 32.6 | 0.45 | 1.2670097 | 1.2694944 | 1.2710417 | |
| Aug. 5 | 210 44 53.9 | 45.52 | 9.3 | 0 31 29.0 | 0.45 | 1.2670323 | 1.2725632 | 1.2740535 | |
| 13 | 210 50 58.0 | 45.51 | 9.3 | 0 31 25.4 | 0.45 | 1.2670550 | 1.2755055 | 1.2769134 | |
| 21 | 210 57 2.1 | 45.51 | 9.3 | 0 31 21.8 | 0.45 | 1.2670777 | 1.2782726 | 1.2795782 | |
| 29 | 211 3 6.2 | 45.50 | -9.3 | +0 31 18.2 | -0.45 | 1.2671005 | 1.2808254 | 1.2820089 | |
| Sept. 6 | 211 9 10.2 | 45.50 | 9.3 | 0 31 14.5 | 0.45 | 1.2671233 | 1.2831244 | 1.2841671 | |
| 14 | 211 15 14.2 | 45.49 | 9.3 | 0 31 10.9 | 0.45 | 1.2671462 | 1.2851333 | 1.2860200 | |
| 22 | 211 21 18.1 | 45.49 | 9.3 | 0 31 7.3 | 0.45 | 1.2671691 | 1.2868245 | 1.2875437 | |
| 30 | 211 27 22.0 | 45.48 | 9.3 | 0 31 3.6 | 0.46 | 1.2671921 | 1.2881745 | 1.2887142 | |
| Oct. 8 | 211 33 25.8 | 45.48 | -9.3 | +0 31 0.0 | -0.46 | 1.2672151 | 1.2891602 | 1.2895113 | |
| 16 | 211 39 29.6 | 45.47 | 9.3 | 0 30 56.3 | 0.46 | 1.2672382 | 1.2897664 | 1.2899245 | |
| 24 | 211 45 33.3 | 45.47 | 9.3 | 0 30 52.7 | 0.46 | 1.2672613 | 1.2899849 | 1.2899469 | |
| Nov. 1 | 211 51 37.0 | 45.46 | 9.3 | 0 30 49.0 | 0.46 | 1.2672845 | 1.2898098 | 1.2895735 | |
| 9 | 211 57 40.7 | 45.45 | 9.3 | 0 30 45.3 | 0.46 | 1.2673078 | 1.2892390 | 1.2888075 | |
| 17 | 212 3 44.3 | 45.45 | -9.3 | +0 30 41.7 | -0.46 | 1.2673311 | 1.2882807 | 1.2876598 | |
| 25 | 212 9 47.9 | 45.44 | 9.3 | 0 30 38.0 | 0.46 | 1.2673544 | 1.2869469 | 1.2861436 | |
| Dec. 3 | 212 15 51.4 | 45.44 | 9.3 | 0 30 34.3 | 0.46 | 1.2673779 | 1.2852526 | 1.2842774 | |
| 11 | 212 21 54.9 | 45.43 | 9.3 | 0 30 30.6 | 0.46 | 1.2674013 | 1.2832220 | 1.2820907 | |
| 19 | 212 27 58.3 | 45.43 | 9.3 | 0 30 26.9 | 0.46 | 1.2674248 | 1.2806874 | 1.2796166 | |
| 27 | 212 34 1.7 | 45.42 | -9.3 | +0 30 23.2 | -0.46 | 1.2674484 | 1.2782831 | 1.2768918 | |
| 35 | 212 40 5.1 | 45.42 | -9.3 | +0 30 19.5 | -0.46 | 1.2674720 | | | |

NEPTUNE.

GREENWICH MEAN NOON.

| Date. | Heliocentric Longitude, Mean Equinox of Date. | Daily Motion. | Reduction to Orbit. | Heliocentric Latitude. | Daily Motion. | Logarithm of Radius Vector. | Logarithm of Distance from Earth— | |
|---------|--|------------------|---------------------------|---------------------------|------------------|--------------------------------------|--------------------------------------|----------------------------|
| | | | | | | | At Date. | At Interme- diate Date. |
| Jan. 1 | 65 36 49.3 | 22.01 | -38.1 | -1 36 46.7 | +0.29 | 1.4746703 | 1.4629056 | 1.4635522 |
| 9 | 65 39 45.3 | 22.01 | 38.2 | 1 36 44.4 | 0.29 | 1.4746720 | 1.4642538 | 1.4650072 |
| 17 | 65 42 41.4 | 22.01 | 38.3 | 1 36 42.1 | 0.29 | 1.4746738 | 1.4658075 | 1.4666501 |
| 25 | 65 45 37.5 | 22.01 | 38.3 | 1 36 39.7 | 0.29 | 1.4746755 | 1.4675303 | 1.4684435 |
| Feb. 2 | 65 48 33.6 | 22.01 | 38.4 | 1 36 37.4 | 0.29 | 1.4746773 | 1.4693849 | 1.4703500 |
| 10 | 65 51 29.7 | 22.01 | -38.4 | -1 36 35.1 | +0.29 | 1.4746791 | 1.4713333 | 1.4723297 |
| 18 | 65 54 25.8 | 22.01 | 38.5 | 1 36 32.7 | 0.29 | 1.4746808 | 1.4733340 | 1.4743409 |
| 26 | 65 57 21.9 | 22.01 | 38.5 | 1 36 30.4 | 0.29 | 1.4746826 | 1.4753461 | 1.4763449 |
| Mar. 6 | 66 0 18.0 | 22.01 | 38.6 | 1 36 28.0 | 0.29 | 1.4746844 | 1.4773326 | 1.4783046 |
| 14 | 66 3 14.1 | 22.01 | 38.6 | 1 36 25.7 | 0.29 | 1.4746862 | 1.4792563 | 1.4801830 |
| 22 | 66 6 10.2 | 22.01 | -38.7 | -1 36 23.3 | +0.29 | 1.4746880 | 1.4810813 | 1.4819472 |
| 30 | 66 9 6.3 | 22.01 | 38.7 | 1 36 21.0 | 0.29 | 1.4746898 | 1.4827777 | 1.4835693 |
| Apr. 7 | 66 12 2.4 | 22.01 | 38.8 | 1 36 18.6 | 0.30 | 1.4746916 | 1.4843190 | 1.4850231 |
| 15 | 66 14 58.5 | 22.01 | 38.8 | 1 36 16.2 | 0.30 | 1.4746934 | 1.4856794 | 1.4862849 |
| 23 | 66 17 54.7 | 22.02 | 38.9 | 1 36 13.9 | 0.30 | 1.4746952 | 1.4868380 | 1.4873369 |
| May 1 | 66 20 50.8 | 22.02 | -38.9 | -1 36 11.5 | +0.30 | 1.4746970 | 1.4877800 | 1.4881654 |
| 9 | 66 23 46.9 | 22.02 | 39.0 | 1 36 9.1 | 0.30 | 1.4746988 | 1.4884919 | 1.4887578 |
| 17 | 66 26 43.0 | 22.02 | 39.0 | 1 36 6.7 | 0.30 | 1.4747006 | 1.4889629 | 1.4891066 |
| 25 | 66 29 39.2 | 22.02 | 39.1 | 1 36 4.3 | 0.30 | 1.4747024 | 1.4891888 | 1.4892091 |
| June 2 | 66 32 35.3 | 22.02 | 39.2 | 1 36 1.9 | 0.30 | 1.4747042 | 1.4891677 | 1.4890644 |
| 10 | 66 35 31.4 | 22.02 | -39.2 | -1 35 59.5 | +0.30 | 1.4747060 | 1.4888099 | 1.4886745 |
| 18 | 66 38 27.6 | 22.02 | 39.3 | 1 35 57.1 | 0.30 | 1.4747078 | 1.4883897 | 1.4880407 |
| 26 | 66 41 23.7 | 22.02 | 39.3 | 1 35 54.7 | 0.30 | 1.4747096 | 1.4876468 | 1.4871911 |
| July 4 | 66 44 19.9 | 22.02 | 39.4 | 1 35 52.3 | 0.30 | 1.4747115 | 1.4866812 | 1.4861191 |
| 12 | 66 47 16.0 | 22.02 | 39.4 | 1 35 49.9 | 0.30 | 1.4747133 | 1.4855068 | 1.4848470 |
| 20 | 66 50 12.2 | 22.02 | -39.5 | -1 35 47.5 | +0.30 | 1.4747151 | 1.4841422 | 1.4833949 |
| 28 | 66 53 8.3 | 22.02 | 39.5 | 1 35 45.1 | 0.30 | 1.4747169 | 1.4826082 | 1.4817848 |
| Aug. 5 | 66 56 4.5 | 22.02 | 39.6 | 1 35 42.6 | 0.30 | 1.4747188 | 1.4809291 | 1.4800411 |
| 13 | 66 59 0.6 | 22.02 | 39.6 | 1 35 40.2 | 0.30 | 1.4747206 | 1.4791279 | 1.4781926 |
| 21 | 67 1 56.8 | 22.02 | 39.7 | 1 35 37.8 | 0.30 | 1.4747225 | 1.4772389 | 1.4762706 |
| 29 | 67 4 53.0 | 22.02 | -39.7 | -1 35 35.3 | +0.31 | 1.4747243 | 1.4752920 | 1.4743069 |
| Sept. 6 | 67 7 49.1 | 22.02 | 39.8 | 1 35 32.9 | 0.31 | 1.4747261 | 1.4733204 | 1.4723373 |
| 14 | 67 10 45.3 | 22.02 | 39.8 | 1 35 30.4 | 0.31 | 1.4747280 | 1.4713621 | 1.4703996 |
| 22 | 67 13 41.5 | 22.02 | 39.9 | 1 35 28.0 | 0.31 | 1.4747298 | 1.4694541 | 1.4685299 |
| 30 | 67 16 37.7 | 22.02 | 39.9 | 1 35 25.5 | 0.31 | 1.4747316 | 1.4676320 | 1.4667655 |
| Oct. 8 | 67 19 33.8 | 22.02 | -40.0 | -1 35 23.1 | +0.31 | 1.4747335 | 1.4659349 | 1.4651452 |
| 16 | 67 22 30.0 | 22.02 | 40.0 | 1 35 20.6 | 0.31 | 1.4747353 | 1.4644001 | 1.4637036 |
| 24 | 67 25 26.2 | 22.02 | 40.1 | 1 35 18.1 | 0.31 | 1.4747372 | 1.4630595 | 1.4624720 |
| Nov. 1 | 67 28 22.4 | 22.02 | 40.1 | 1 35 15.7 | 0.31 | 1.4747390 | 1.4619443 | 1.4614805 |
| 9 | 67 31 18.6 | 22.02 | 40.2 | 1 35 13.2 | 0.31 | 1.4747409 | 1.4610827 | 1.4607537 |
| 17 | 67 34 14.8 | 22.02 | -40.2 | -1 35 10.7 | +0.31 | 1.4747427 | 1.4604950 | 1.4603084 |
| 25 | 67 37 11.0 | 22.02 | 40.3 | 1 35 8.2 | 0.31 | 1.4747446 | 1.4601951 | 1.4601567 |
| Dec. 3 | 67 40 7.2 | 22.02 | 40.3 | 1 35 5.7 | 0.31 | 1.4747464 | 1.4601934 | 1.4603049 |
| 11 | 67 43 3.4 | 22.03 | 40.4 | 1 35 3.2 | 0.31 | 1.4747483 | 1.4604907 | 1.4607497 |
| 19 | 67 45 59.6 | 22.03 | 40.4 | 1 35 0.7 | 0.31 | 1.4747502 | 1.4610800 | 1.4614801 |
| 27 | 67 48 55.8 | 22.03 | -40.5 | -1 34 58.2 | +0.31 | 1.4747520 | 1.4619481 | 1.4624815 |
| 35 | 67 51 52.0 | 22.03 | -40.5 | -1 34 55.7 | +0.31 | 1.4747539 | 1.4630769 | |

FOR GREENWICH MEAN NOON AND MIDNIGHT.

| Date. | X True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Y True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Z True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. |
|--------|--------------------|------------|--|--------------------|------------|--|--------------------|------------|--|
| | Noon. | Midnight. | | Noon. | Midnight. | | Noon. | Midnight. | |
| Jan. 1 | +0.1849500 | +0.1935332 | +743 | -0.8858859 | -0.8843442 | + 89 | -0.3843464 | -0.3836776 | +153 |
| 2 | 0.2021013 | 0.2106542 | 732 | 0.8927332 | 0.8810537 | 99 | 0.3829789 | 0.3822505 | 158 |
| 3 | 0.2191913 | 0.2277116 | 721 | 0.8793053 | 0.8774885 | 109 | 0.3814922 | 0.3807043 | 163 |
| 4 | 0.2362146 | 0.2446996 | 709 | 0.8756032 | 0.8736497 | 119 | 0.3798865 | 0.3790393 | 167 |
| 5 | 0.2531658 | 0.2616128 | 698 | 0.8716280 | 0.8695383 | 128 | 0.3781623 | 0.3772560 | 172 |
| 6 | +0.2700396 | +0.2784456 | +686 | -0.8673806 | -0.8651551 | +137 | -0.3763202 | -0.3753551 | +176 |
| 7 | 0.2868301 | 0.2951924 | 674 | 0.8628620 | 0.8605012 | 146 | 0.3743606 | 0.3733369 | 180 |
| 8 | 0.3035318 | 0.3118477 | 662 | 0.8580731 | 0.8555778 | 154 | 0.3722838 | 0.3712017 | 184 |
| 9 | 0.3201392 | 0.3284059 | 650 | 0.8530154 | 0.8503865 | 162 | 0.3700903 | 0.3689501 | 188 |
| 10 | 0.3366469 | 0.3448616 | 638 | 0.8476908 | 0.8449291 | 170 | 0.3677808 | 0.3665829 | 191 |
| 11 | +0.3530493 | +0.3612092 | +626 | -0.8421012 | -0.8392078 | +178 | -0.3653562 | -0.3641011 | +195 |
| 12 | 0.3693408 | 0.3774431 | 613 | 0.8362487 | 0.8332246 | 185 | 0.3628175 | 0.3615056 | 198 |
| 13 | 0.3855158 | 0.3935581 | 601 | 0.8301352 | 0.8269814 | 192 | 0.3601654 | 0.3587971 | 201 |
| 14 | 0.4015694 | 0.4095492 | 589 | 0.8237629 | 0.8204804 | 198 | 0.3574008 | 0.3559766 | 204 |
| 15 | 0.4174967 | 0.4254115 | 577 | 0.8171340 | 0.8137241 | 205 | 0.3545247 | 0.3530452 | 207 |
| 16 | +0.4332928 | +0.4411402 | +565 | -0.8102510 | -0.8067150 | +211 | -0.3515383 | -0.3500041 | +209 |
| 17 | 0.4489529 | 0.4567304 | 553 | 0.8031163 | 0.7994555 | 217 | 0.3484426 | 0.3468542 | 212 |
| 18 | 0.4644720 | 0.4721772 | 541 | 0.7957326 | 0.7919483 | 222 | 0.3452387 | 0.3435966 | 214 |
| 19 | 0.4798453 | 0.4874759 | 529 | 0.7881027 | 0.7841963 | 228 | 0.3419278 | 0.3402326 | 216 |
| 20 | 0.4950683 | 0.5026222 | 517 | 0.7802295 | 0.7762023 | 233 | 0.3385113 | 0.3367637 | 218 |
| 21 | +0.5101368 | +0.5176120 | +505 | -0.7721155 | -0.7679688 | +238 | -0.3349902 | -0.3331909 | +220 |
| 22 | 0.5250467 | 0.5324409 | 493 | 0.7637630 | 0.7594982 | 243 | 0.3313658 | 0.3295152 | 222 |
| 23 | 0.5397936 | 0.5471047 | 481 | 0.7551748 | 0.7507933 | 247 | 0.3276392 | 0.3257380 | 224 |
| 24 | 0.5543733 | 0.5615993 | 469 | 0.7463538 | 0.7418569 | 251 | 0.3238117 | 0.3218605 | 225 |
| 25 | 0.5687818 | 0.5759207 | 457 | 0.7373029 | 0.7326919 | 255 | 0.3198846 | 0.3178840 | 227 |
| 26 | +0.5830151 | +0.5900647 | +445 | -0.7280247 | -0.7233010 | +258 | -0.3158590 | -0.3138096 | +228 |
| 27 | 0.5970688 | 0.6040271 | 433 | 0.7185217 | 0.7136867 | 261 | 0.3117359 | 0.3096392 | 229 |
| 28 | 0.6109389 | 0.6178040 | 422 | 0.7087965 | 0.7038515 | 261 | 0.3075166 | 0.3053711 | 230 |
| 29 | 0.6246216 | 0.6313914 | 410 | 0.6988518 | 0.6937983 | 267 | 0.3032022 | 0.3010097 | 231 |
| 30 | 0.6381127 | 0.6447851 | 399 | 0.6886909 | 0.6835303 | 269 | 0.2987941 | 0.2965553 | 231 |
| 31 | +0.6514080 | +0.6579810 | +388 | -0.6783168 | -0.6730506 | +272 | -0.2942936 | -0.2920091 | +231 |
| Feb. 1 | 0.6645033 | 0.6709748 | 377 | 0.6677321 | 0.6623618 | 274 | 0.2897020 | 0.2873724 | 232 |
| 2 | 0.6773946 | 0.6837624 | 366 | 0.6569398 | 0.6514664 | 276 | 0.2850204 | 0.2826463 | 232 |
| 3 | 0.6900776 | 0.6963396 | 355 | 0.6459431 | 0.6403693 | 278 | 0.2802502 | 0.2778323 | 232 |
| 4 | 0.7025479 | 0.7087020 | 344 | 0.6347455 | 0.6290726 | 280 | 0.2753928 | 0.2729318 | 232 |
| 5 | +0.7148014 | +0.7208457 | +333 | -0.6233507 | -0.6175805 | +281 | -0.2704497 | -0.2679465 | +231 |
| 6 | 0.7268344 | 0.7327669 | 322 | 0.6117622 | 0.6058965 | 282 | 0.2654225 | 0.2628779 | 231 |
| 7 | 0.7386430 | 0.7444618 | 312 | 0.5999836 | 0.5940243 | 283 | 0.2603128 | 0.2577276 | 230 |
| 8 | 0.7502232 | 0.7559263 | 301 | 0.5880188 | 0.5819678 | 284 | 0.2551223 | 0.2524973 | 229 |
| 9 | 0.7615710 | 0.7671566 | 291 | 0.5758717 | 0.5697312 | 285 | 0.2498525 | 0.2471885 | 228 |
| 10 | +0.7726829 | +0.7781493 | +281 | -0.5635466 | -0.5573187 | +286 | -0.2445052 | -0.2418031 | +227 |
| 11 | 0.7835555 | 0.7889011 | 271 | 0.5510478 | 0.5447346 | 286 | 0.2390824 | 0.2363432 | 226 |
| 12 | 0.7941857 | 0.7994089 | 261 | 0.5383795 | 0.5319832 | 287 | 0.2335859 | 0.2308107 | 225 |
| 13 | 0.8045703 | 0.8096696 | 251 | 0.5255460 | 0.5190687 | 287 | 0.2280177 | 0.2252073 | 223 |
| 14 | 0.8147062 | 0.8196800 | 241 | 0.5125516 | 0.5059955 | 287 | 0.2223796 | 0.2195350 | 221 |
| 15 | +0.8245903 | +0.8294373 | +232 | -0.4994007 | -0.4927680 | +287 | -0.2166733 | -0.2137954 | +219 |

FOR GREENWICH MEAN NOON AND MIDNIGHT.

| Date. | X True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Y True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Z True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. |
|---------|--------------------|------------|--|--------------------|------------|--|--------------------|------------|--|
| | Noon. | Midnight. | | Noon. | Midnight. | | Noon. | Midnight. | |
| Feb. 15 | +0.8245903 | +0.8294373 | +232 | -0.4994007 | -0.4927680 | +237 | -0.2166733 | -0.2137954 | +219 |
| 16 | 0.8342202 | 0.8389391 | 222 | 0.4860978 | 0.4793907 | 286 | 0.2109009 | 0.2079906 | 217 |
| 17 | 0.8435937 | 0.8481835 | 213 | 0.4726472 | 0.4658679 | 286 | 0.2050645 | 0.2021228 | 215 |
| 18 | 0.8527083 | 0.8571678 | 204 | 0.4590533 | 0.4522038 | 285 | 0.1991659 | 0.1961939 | 213 |
| 19 | 0.8615617 | 0.8658898 | 195 | 0.4453201 | 0.4384027 | 284 | 0.1932071 | 0.1902056 | 211 |
| 20 | +0.8701518 | +0.8743474 | +186 | -0.4314521 | -0.4244689 | +284 | -0.1871898 | -0.1841598 | +209 |
| 21 | 0.8784764 | 0.8825385 | 177 | 0.4174536 | 0.4104067 | 284 | 0.1811159 | 0.1780583 | 206 |
| 22 | 0.8865334 | 0.8904610 | 168 | 0.4033287 | 0.3962202 | 283 | 0.1749873 | 0.1719031 | 204 |
| 23 | 0.8943209 | 0.8981130 | 160 | 0.3890817 | 0.3819138 | 282 | 0.1688059 | 0.1656960 | 201 |
| 24 | 0.9018370 | 0.9054926 | 152 | 0.3747169 | 0.3674916 | 281 | 0.1625735 | 0.1594388 | 198 |
| 25 | +0.9090796 | +0.9125977 | +144 | -0.3602382 | -0.3529574 | +279 | -0.1562918 | -0.1531331 | +195 |
| 26 | 0.9160467 | 0.9194265 | 136 | 0.3456495 | 0.3383152 | 278 | 0.1499625 | 0.1467807 | 192 |
| 27 | 0.9227367 | 0.9259771 | 128 | 0.3309549 | 0.3235693 | 276 | 0.1435874 | 0.1403834 | 189 |
| 28 | 0.9291477 | 0.9322476 | 120 | 0.3161588 | 0.3087240 | 275 | 0.1371684 | 0.1339432 | 186 |
| Mar. 1 | 0.9352770 | 0.9382359 | 113 | 0.3012656 | 0.2937840 | 273 | 0.1307075 | 0.1274619 | 182 |
| 2 | +0.9411237 | +0.9439400 | +106 | -0.2862799 | -0.2787537 | +271 | -0.1242065 | -0.1209415 | +179 |
| 3 | 0.9466850 | 0.9493582 | 99 | 0.2712061 | 0.2636375 | 269 | 0.1176672 | 0.1143838 | 175 |
| 4 | 0.9519595 | 0.9544887 | 92 | 0.2560486 | 0.2484399 | 267 | 0.1110916 | 0.1077908 | 171 |
| 5 | 0.9569455 | 0.9593298 | 85 | 0.2408119 | 0.2331655 | 265 | 0.1044816 | 0.1011644 | 167 |
| 6 | 0.9616413 | 0.9638799 | 78 | 0.2255008 | 0.2178189 | 263 | 0.0978392 | 0.0945066 | 163 |
| 7 | +0.9660453 | +0.9681375 | +72 | -0.2101200 | -0.2024051 | +261 | -0.0911664 | -0.0878194 | +159 |
| 8 | 0.9701561 | 0.9721012 | 65 | 0.1946745 | 0.1869292 | 259 | 0.0844654 | 0.0811051 | 155 |
| 9 | 0.9739725 | 0.9757698 | 59 | 0.1791696 | 0.1713964 | 257 | 0.0777385 | 0.0743660 | 151 |
| 10 | 0.9774933 | 0.9791425 | 53 | 0.1636102 | 0.1558116 | 255 | 0.0709877 | 0.0676041 | 147 |
| 11 | 0.9807176 | 0.9822183 | 47 | 0.1480011 | 0.1401797 | 253 | 0.0642152 | 0.0608217 | 142 |
| 12 | +0.9836447 | +0.9849965 | +41 | -0.1323476 | -0.1245059 | +251 | -0.0574234 | -0.0540210 | +138 |
| 13 | 0.9862730 | 0.9874767 | 36 | 0.1166548 | 0.1087953 | 248 | 0.0506144 | 0.0472042 | 133 |
| 14 | 0.9886049 | 0.9896585 | 30 | 0.1009278 | 0.0930529 | 246 | 0.0437904 | 0.0403735 | 129 |
| 15 | 0.9906375 | 0.9915418 | 25 | 0.0851713 | 0.0772837 | 243 | 0.0369535 | 0.0335311 | 124 |
| 16 | 0.9923715 | 0.9931266 | 20 | 0.0693906 | 0.0614927 | 240 | 0.0301061 | 0.0266791 | 119 |
| 17 | +0.9938070 | +0.9944129 | +15 | -0.0535907 | -0.0456249 | +237 | -0.0232503 | -0.0198198 | +114 |
| 18 | 0.9949441 | 0.9954011 | 10 | 0.0377761 | 0.0298647 | 234 | 0.0163881 | 0.0129553 | 109 |
| 19 | 0.9957834 | 0.9960915 | 6 | 0.0219513 | -0.0140366 | 231 | 0.0095216 | -0.0060875 | 104 |
| 20 | 0.9963256 | 0.9964845 | +1 | -0.0061211 | +0.0017945 | 228 | -0.0026530 | +0.0007814 | 99 |
| 21 | 0.9965895 | 0.9965804 | -3 | +0.0097096 | 0.0176237 | 224 | +0.0042157 | 0.0076494 | 94 |
| 22 | +0.9965170 | +0.9963797 | -7 | +0.0255361 | +0.0334465 | +221 | +0.0110826 | +0.0145146 | +89 |
| 23 | 0.9961663 | 0.9958830 | 11 | 0.0413541 | 0.0492587 | 218 | 0.0179457 | 0.0213751 | 84 |
| 24 | 0.9955238 | 0.9950908 | 15 | 0.0571595 | 0.0650561 | 215 | 0.0248030 | 0.0282289 | 79 |
| 25 | 0.9945840 | 0.9940036 | 18 | 0.0729479 | 0.0808343 | 211 | 0.0316528 | 0.0350743 | 74 |
| 26 | 0.9933495 | 0.9926221 | 21 | 0.0887148 | 0.0965888 | 208 | 0.0384932 | 0.0419093 | 69 |
| 27 | +0.9918212 | +0.9909470 | -24 | +0.1014558 | +0.1123152 | +204 | +0.0453222 | +0.0487320 | +64 |
| 28 | 0.9899995 | 0.9889786 | 27 | 0.1201665 | 0.1280092 | 201 | 0.0521380 | 0.0555404 | 59 |
| 29 | 0.9878846 | 0.9867174 | 30 | 0.1358427 | 0.1436665 | 197 | 0.0589387 | 0.0623328 | 54 |
| 30 | 0.9854770 | 0.9841639 | 33 | 0.1514800 | 0.1592826 | 194 | 0.0657225 | 0.0691074 | 49 |
| 31 | 0.9827776 | 0.9813189 | 35 | 0.1670737 | 0.1748529 | 190 | 0.0724874 | 0.0758622 | 44 |
| 32 | +0.9797873 | +0.9781833 | -38 | +0.1826194 | +0.1903729 | +186 | +0.0792315 | +0.0825952 | +39 |

| FOR GREENWICH MEAN NOON AND MIDNIGHT. | | | | | | | | | |
|---------------------------------------|--------------------|------------|--|--------------------|------------|--|--------------------|------------|--|
| Date. | X True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Y True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Z True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. |
| | Noon. | Midnight. | | Noon. | Midnight. | | Noon. | Midnight. | |
| Apr. 1 | +0.9797873 | +0.9781833 | -38 | +0.1826194 | +0.1903729 | +186 | +0.0792315 | +0.0825952 | + 39 |
| 2 | 0.9765069 | 0.9747579 | 40 | 0.1981126 | 0.2058381 | 182 | 0.0859530 | 0.0893045 | 34 |
| 3 | 0.9729368 | 0.9710433 | 42 | 0.2135486 | 0.2212437 | 178 | 0.0926498 | 0.0959882 | 28 |
| 4 | 0.9690778 | 0.9670404 | 43 | 0.2289226 | 0.2365849 | 174 | 0.0993198 | 0.1026441 | 23 |
| 5 | 0.9649312 | 0.9627507 | 45 | 0.2442299 | 0.2518570 | 170 | 0.1059609 | 0.1092701 | 18 |
| 6 | +0.9604987 | +0.9581756 | -46 | +0.2594656 | +0.2670552 | +167 | +0.1125711 | +0.1158640 | + 13 |
| 7 | 0.9557816 | 0.9533166 | 47 | 0.2746251 | 0.2821749 | 163 | 0.1191485 | 0.1224242 | 8 |
| 8 | 0.9507811 | 0.9481752 | 48 | 0.2897033 | 0.2972113 | 159 | 0.1256911 | 0.1289485 | + 2 |
| 9 | 0.9454990 | 0.9427532 | 49 | 0.3046968 | 0.3121598 | 155 | 0.1321966 | 0.1354347 | - 3 |
| 10 | 0.9399375 | 0.9370528 | 50 | 0.3195995 | 0.3270157 | 150 | 0.1386629 | 0.1418808 | 8 |
| 11 | +0.9340989 | +0.9310763 | -50 | +0.3344074 | +0.3417745 | +146 | +0.1450881 | +0.1482848 | - 14 |
| 12 | 0.9279851 | 0.9248257 | 50 | 0.3491161 | 0.3564318 | 142 | 0.1514704 | 0.1546448 | 19 |
| 13 | 0.9215983 | 0.9183033 | 50 | 0.3637209 | 0.3709830 | 138 | 0.1578077 | 0.1609588 | 24 |
| 14 | 0.9149410 | 0.9115117 | 50 | 0.3782174 | 0.3854237 | 133 | 0.1640980 | 0.1672249 | 29 |
| 15 | 0.9080158 | 0.9044536 | 49 | 0.3926015 | 0.3997501 | 129 | 0.1703394 | 0.1734413 | 34 |
| 16 | +0.9008254 | +0.8971316 | -48 | +0.4068693 | +0.4139585 | +125 | +0.1765303 | +0.1796063 | - 39 |
| 17 | 0.8933726 | 0.8895485 | 47 | 0.4210172 | 0.4280450 | 121 | 0.1826690 | 0.1857182 | 44 |
| 18 | 0.8856599 | 0.8817069 | 46 | 0.4350413 | 0.4420056 | 116 | 0.1887537 | 0.1917753 | 49 |
| 19 | 0.8776899 | 0.8736093 | 45 | 0.4489375 | 0.4558364 | 112 | 0.1947829 | 0.1977761 | 54 |
| 20 | 0.8694654 | 0.8652585 | 43 | 0.4627020 | 0.4695339 | 107 | 0.2007549 | 0.2037189 | 59 |
| 21 | +0.8609891 | +0.8566573 | -41 | +0.4763315 | +0.4830946 | +103 | +0.2066681 | +0.2096022 | - 64 |
| 22 | 0.8522637 | 0.8478085 | 39 | 0.4898227 | 0.4965153 | 98 | 0.2125211 | 0.2154246 | 68 |
| 23 | 0.8432921 | 0.8387148 | 37 | 0.5031720 | 0.5097924 | 94 | 0.2183124 | 0.2211845 | 73 |
| 24 | 0.8340769 | 0.8293787 | 34 | 0.5163759 | 0.5229222 | 89 | 0.2240404 | 0.2268803 | 77 |
| 25 | 0.8246206 | 0.8198028 | 32 | 0.5294307 | 0.5359012 | 85 | 0.2297037 | 0.2325107 | 81 |
| 26 | +0.8149258 | +0.8099898 | -29 | +0.5423330 | +0.5487259 | + 80 | +0.2353009 | +0.2380743 | - 85 |
| 27 | 0.8049952 | 0.7999424 | 26 | 0.5550794 | 0.5613930 | 76 | 0.2408305 | 0.2435695 | 89 |
| 28 | 0.7946315 | 0.7896631 | 22 | 0.5676666 | 0.5738992 | 71 | 0.2462910 | 0.2489949 | 94 |
| 29 | 0.7844376 | 0.7791554 | 19 | 0.5800910 | 0.5862410 | 67 | 0.2516809 | 0.2543489 | 98 |
| 30 | 0.7738166 | 0.7684217 | 15 | 0.5923492 | 0.5984147 | 63 | 0.2569987 | 0.2596301 | 103 |
| May 1 | +0.7629711 | +0.7574650 | -11 | +0.6044374 | +0.6104165 | + 59 | +0.2622429 | +0.2648369 | -107 |
| 2 | 0.7519039 | 0.7462881 | 6 | 0.6163518 | 0.6222427 | 55 | 0.2674119 | 0.2699678 | 111 |
| 3 | 0.7406180 | 0.7348942 | - 2 | 0.6280888 | 0.6338897 | 51 | 0.2725042 | 0.2750211 | 115 |
| 4 | 0.7291170 | 0.7232870 | + 3 | 0.6396449 | 0.6453541 | 47 | 0.2775181 | 0.2799953 | 119 |
| 5 | 0.7174045 | 0.7114700 | 8 | 0.6510168 | 0.6566326 | 43 | 0.2824522 | 0.2848889 | 123 |
| 6 | +0.7054838 | +0.6994465 | +13 | +0.6622010 | +0.6677217 | + 40 | +0.2873050 | +0.2897005 | -126 |
| 7 | 0.6933584 | 0.6872201 | 18 | 0.6731942 | 0.6786181 | 36 | 0.2920751 | 0.2944286 | 130 |
| 8 | 0.6810321 | 0.6747948 | 24 | 0.6839930 | 0.6893183 | 33 | 0.2967609 | 0.2990717 | 133 |
| 9 | 0.6685089 | 0.6621747 | 30 | 0.6945939 | 0.6998191 | 30 | 0.3013609 | 0.3036283 | 137 |
| 10 | 0.6557929 | 0.6493640 | 36 | 0.7049938 | 0.7101176 | 27 | 0.3058737 | 0.3080971 | 140 |
| 11 | +0.6428884 | +0.6363667 | +42 | +0.7151901 | +0.7202111 | + 24 | +0.3102981 | +0.3124770 | -143 |
| 12 | 0.6297994 | 0.6231869 | 48 | 0.7251801 | 0.7300968 | 21 | 0.3146331 | 0.3167667 | 146 |
| 13 | 0.6165300 | 0.6098290 | 55 | 0.7349609 | 0.7397719 | 18 | 0.3198773 | 0.3209649 | 149 |
| 14 | 0.6030246 | 0.5962972 | 62 | 0.7445295 | 0.7492335 | 16 | 0.3230292 | 0.3250703 | 151 |
| 15 | 0.5894674 | 0.5825957 | 69 | 0.7538835 | 0.7584794 | 13 | 0.3270878 | 0.3290819 | 154 |
| 16 | +0.5756827 | +0.5687289 | +76 | +0.7630202 | +0.7675076 | + 11 | +0.3310522 | +0.3329989 | -156 |

FOR GREENWICH MEAN NOON AND MIDNIGHT.

| Date. | X True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Y True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Z True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. |
|--------|--------------------|------------|--|--------------------|------------|--|--------------------|------------|--|
| | Noon. | Midnight. | | Noon. | Midnight. | | Noon. | Midnight. | |
| May 16 | +0.5756827 | +0.5687289 | + 76 | +0.7630208 | +0.7675076 | + 11 | +0.3310522 | +0.3329989 | -156 |
| 17 | 0.5617348 | 0.5547011 | 83 | 0.7719394 | 0.7763162 | 8 | 0.3349215 | 0.3368204 | 158 |
| 18 | 0.5476282 | 0.5405168 | 91 | 0.7806375 | 0.7849031 | 6 | 0.3386950 | 0.3405456 | 160 |
| 19 | 0.5333671 | 0.5261799 | 99 | 0.7891129 | 0.7932663 | 4 | 0.3423717 | 0.3441736 | 162 |
| 20 | 0.5189554 | 0.5116942 | 107 | 0.7973633 | 0.8014036 | + 2 | 0.3459507 | 0.3477034 | 164 |
| 21 | +0.5042968 | +0.4970637 | +115 | +0.8053868 | +0.8093129 | 0 | +0.3494313 | +0.3511343 | -166 |
| 22 | 0.4896954 | 0.4822926 | 123 | 0.8131815 | 0.8169925 | - 1 | 0.3528125 | 0.3544655 | 168 |
| 23 | 0.4748555 | 0.4673850 | 131 | 0.8207456 | 0.8244406 | 2 | 0.3560936 | 0.3576964 | 170 |
| 24 | 0.4598812 | 0.4523449 | 140 | 0.8280774 | 0.8316556 | 3 | 0.3592740 | 0.3608926 | 171 |
| 25 | 0.4447764 | 0.4371764 | 148 | 0.8351752 | 0.8386357 | 3 | 0.3623328 | 0.3638538 | 173 |
| 26 | +0.4295451 | +0.4218834 | +157 | +0.8420370 | +0.8453788 | - 4 | +0.3653292 | +0.3667787 | -174 |
| 27 | 0.4141914 | 0.4064701 | 166 | 0.8486607 | 0.8518828 | 4 | 0.3682024 | 0.3696001 | 176 |
| 28 | 0.3987193 | 0.3909404 | 175 | 0.8550445 | 0.8581459 | 5 | 0.3709717 | 0.3723171 | 177 |
| 29 | 0.3831330 | 0.3752983 | 184 | 0.8611866 | 0.8641664 | 5 | 0.3736363 | 0.3749290 | 178 |
| 30 | 0.3674365 | 0.3595481 | 194 | 0.8670851 | 0.8699424 | 4 | 0.3761953 | 0.3774350 | 179 |
| 31 | +0.3516339 | +0.3436943 | +203 | +0.8727381 | +0.8754719 | - 4 | +0.3786480 | +0.3798342 | -180 |
| June 1 | 0.3357299 | 0.3277414 | 213 | 0.8781436 | 0.8807530 | 3 | 0.3809935 | 0.3821259 | 180 |
| 2 | 0.3197292 | 0.3116940 | 222 | 0.8832999 | 0.8857841 | - 2 | 0.3832311 | 0.3843092 | 181 |
| 3 | 0.3036363 | 0.2955568 | 232 | 0.8882053 | 0.8905636 | 0 | 0.3853600 | 0.3863834 | 181 |
| 4 | 0.2874560 | 0.2793347 | 241 | 0.8928585 | 0.8950900 | + 1 | 0.3873794 | 0.3883478 | 181 |
| 5 | +0.2711933 | +0.2630326 | +251 | +0.8972579 | +0.8993619 | + 3 | +0.3892888 | +0.3902019 | -181 |
| 6 | 0.2548531 | 0.2466554 | 261 | 0.9014020 | 0.9033778 | 5 | 0.3910874 | 0.3919450 | 181 |
| 7 | 0.2384401 | 0.2302080 | 271 | 0.9052894 | 0.9071365 | 7 | 0.3927747 | 0.3935765 | 181 |
| 8 | 0.2219595 | 0.2136955 | 281 | 0.9089192 | 0.9106373 | 9 | 0.3943502 | 0.3950960 | 181 |
| 9 | 0.2054164 | 0.1971229 | 291 | 0.9122908 | 0.9138795 | 12 | 0.3958136 | 0.3965031 | 180 |
| 10 | +0.1888156 | +0.1804952 | +301 | +0.9154033 | +0.9168622 | + 15 | +0.3971644 | +0.3977975 | -179 |
| 11 | 0.1721622 | 0.1638174 | 311 | 0.9182560 | 0.9195847 | 19 | 0.3984024 | 0.3989789 | 178 |
| 12 | 0.1554613 | 0.1470946 | 321 | 0.9208482 | 0.9220464 | 22 | 0.3995272 | 0.4000471 | 177 |
| 13 | 0.1387179 | 0.1303318 | 330 | 0.9231794 | 0.9242471 | 26 | 0.4005386 | 0.4010019 | 176 |
| 14 | 0.1219368 | 0.1135337 | 340 | 0.9252495 | 0.9261866 | 30 | 0.4014366 | 0.4018432 | 174 |
| 15 | +0.1051228 | +0.0967050 | +350 | +0.9270583 | +0.9278648 | + 35 | +0.4022212 | +0.4025710 | -172 |
| 16 | 0.0882807 | 0.0798505 | 360 | 0.9286058 | 0.9292816 | 40 | 0.4028923 | 0.4031852 | 170 |
| 17 | 0.0714151 | 0.0629750 | 369 | 0.9298920 | 0.9304371 | 45 | 0.4034498 | 0.4036859 | 169 |
| 18 | 0.0545307 | 0.0460829 | 379 | 0.9309168 | 0.9313312 | 51 | 0.4038937 | 0.4040732 | 167 |
| 19 | 0.0376320 | 0.0291788 | 388 | 0.9316802 | 0.9319639 | 57 | 0.4042242 | 0.4043470 | 165 |
| 20 | +0.0207237 | +0.0122673 | +397 | +0.9321822 | +0.9323353 | + 63 | +0.4044413 | +0.4045074 | -163 |
| 21 | +0.0038101 | -0.0046474 | 406 | 0.9324230 | 0.9324455 | 69 | 0.4045450 | 0.4045545 | 161 |
| 22 | -0.0131045 | 0.0215609 | 415 | 0.9324026 | 0.9322945 | 76 | 0.4045356 | 0.4044884 | 159 |
| 23 | 0.0300158 | 0.0384688 | 424 | 0.9321209 | 0.9318821 | 83 | 0.4044130 | 0.4043091 | 156 |
| 24 | 0.0469193 | 0.0553666 | 433 | 0.9315778 | 0.9312084 | 90 | 0.4041770 | 0.4040166 | 154 |
| 25 | -0.0638103 | -0.0722498 | +442 | +0.9307735 | +0.9302734 | + 97 | +0.4038277 | +0.4036108 | -151 |
| 26 | 0.0806845 | 0.0891140 | 451 | 0.9297080 | 0.9290773 | 105 | 0.4033654 | 0.4030918 | 148 |
| 27 | 0.0975377 | 0.1059549 | 459 | 0.9283814 | 0.9276202 | 113 | 0.4027900 | 0.4024598 | 145 |
| 28 | 0.1143653 | 0.1227679 | 467 | 0.9267938 | 0.9259021 | 121 | 0.4021015 | 0.4017148 | 142 |
| 29 | 0.1311621 | 0.1395475 | 475 | 0.9249451 | 0.9239230 | 129 | 0.4012999 | 0.4008567 | 139 |
| 30 | -0.1479233 | -0.1562891 | +483 | +0.9228356 | +0.9216832 | +137 | +0.4003852 | +0.3998855 | -136 |

| FOR GREENWICH MEAN NOON AND MIDNIGHT. | | | | | | | | | |
|---------------------------------------|--------------------|------------|--|--------------------|------------|--|--------------------|------------|--|
| Date. | X True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Y True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Z True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. |
| | Noon. | Midnight. | | Noon. | Midnight. | | Noon. | Midnight. | |
| July 1 | -0.1646442 | -0.1729880 | +490 | +0.9204656 | +0.9191831 | +146 | +0.3993575 | +0.3988014 | -132 |
| 2 | 0.1813200 | 0.1896395 | 498 | 0.9178355 | 0.9164230 | 155 | 0.3982171 | 0.3976047 | 128 |
| 3 | 0.1979459 | 0.2062386 | 505 | 0.9149458 | 0.9134040 | 164 | 0.3969642 | 0.3962956 | 124 |
| 4 | 0.2145169 | 0.2227802 | 512 | 0.9117975 | 0.9101263 | 173 | 0.3955990 | 0.3948744 | 120 |
| 5 | 0.2310278 | 0.2392591 | 519 | 0.9083907 | 0.9065909 | 183 | 0.3941217 | 0.3933412 | 115 |
| 6 | -0.2474735 | -0.2556704 | +526 | +0.9047268 | +0.9027988 | +193 | +0.3925327 | +0.3916965 | -111 |
| 7 | 0.2638490 | 0.2720090 | 532 | 0.9008068 | 0.8987511 | 203 | 0.3908325 | 0.3899409 | 106 |
| 8 | 0.2801495 | 0.2882703 | 538 | 0.8966318 | 0.8944491 | 213 | 0.3890215 | 0.3880747 | 102 |
| 9 | 0.2963704 | 0.3044495 | 544 | 0.8922032 | 0.8898943 | 224 | 0.3871003 | 0.3860986 | 97 |
| 10 | 0.3125068 | 0.3205417 | 550 | 0.8875225 | 0.8850882 | 235 | 0.3850605 | 0.3840133 | 93 |
| 11 | -0.3285535 | -0.3365417 | +555 | +0.8825913 | +0.8800324 | +246 | +0.3829249 | +0.3818196 | -88 |
| 12 | 0.3445057 | 0.3524450 | 560 | 0.8774114 | 0.8747287 | 257 | 0.3806823 | 0.3795183 | 83 |
| 13 | 0.3603591 | 0.3682475 | 565 | 0.8719843 | 0.8691787 | 268 | 0.3783275 | 0.3771101 | 78 |
| 14 | 0.3761096 | 0.3839449 | 570 | 0.8663119 | 0.8633843 | 279 | 0.3758661 | 0.3745957 | 73 |
| 15 | 0.3917529 | 0.3995329 | 574 | 0.8603961 | 0.8573476 | 291 | 0.3732989 | 0.3719760 | 68 |
| 16 | -0.4072846 | -0.4150073 | +578 | +0.8542389 | +0.8510704 | +302 | +0.3706269 | +0.3692519 | -63 |
| 17 | 0.4227006 | 0.4303640 | 581 | 0.8478422 | 0.8445546 | 314 | 0.3678510 | 0.3664243 | 57 |
| 18 | 0.4379970 | 0.4455992 | 584 | 0.8412078 | 0.8378021 | 326 | 0.3649719 | 0.3634941 | 51 |
| 19 | 0.4531699 | 0.4607088 | 587 | 0.8343376 | 0.8308148 | 338 | 0.3619906 | 0.3604620 | 45 |
| 20 | 0.4682151 | 0.4756885 | 589 | 0.8272337 | 0.8235948 | 350 | 0.3589079 | 0.3573289 | 39 |
| 21 | -0.4831283 | -0.4905342 | +591 | +0.8198980 | +0.8161437 | +362 | +0.3557248 | +0.3540958 | -32 |
| 22 | 0.4979057 | 0.5052424 | 593 | 0.8123322 | 0.8084036 | 374 | 0.3524420 | 0.3507635 | 26 |
| 23 | 0.5125438 | 0.5198095 | 594 | 0.8045380 | 0.8005559 | 387 | 0.3490603 | 0.3473327 | 19 |
| 24 | 0.5270388 | 0.5342314 | 594 | 0.7965173 | 0.7924227 | 399 | 0.3455805 | 0.3438042 | 13 |
| 25 | 0.5413866 | 0.5485040 | 595 | 0.7882722 | 0.7840662 | 412 | 0.3420035 | 0.3401789 | 7 |
| 26 | -0.5555830 | -0.5626233 | +595 | +0.7798047 | +0.7754882 | +424 | +0.3383302 | +0.3364576 | -1 |
| 27 | 0.5696241 | 0.5765852 | 595 | 0.7711167 | 0.7666906 | 437 | 0.3345613 | 0.3326411 | +6 |
| 28 | 0.5835058 | 0.5903857 | 595 | 0.7622100 | 0.7576753 | 450 | 0.3306975 | 0.3287303 | 12 |
| 29 | 0.5972240 | 0.6040205 | 594 | 0.7530867 | 0.7484446 | 463 | 0.3267399 | 0.3247262 | 19 |
| 30 | 0.6107743 | 0.6174852 | 593 | 0.7437493 | 0.7390011 | 476 | 0.3226895 | 0.3206298 | 26 |
| 31 | -0.6241524 | -0.6307756 | +591 | +0.7342004 | +0.7293473 | +489 | +0.3185473 | +0.3164421 | +33 |
| Aug. 1 | 0.6373541 | 0.6438876 | 589 | 0.7244424 | 0.7194857 | 502 | 0.3143143 | 0.3121641 | 40 |
| 2 | 0.6503755 | 0.6568173 | 587 | 0.7144777 | 0.7094187 | 515 | 0.3099916 | 0.3077970 | 47 |
| 3 | 0.6632125 | 0.6695605 | 585 | 0.7043090 | 0.6991401 | 528 | 0.3055804 | 0.3033420 | 54 |
| 4 | 0.6758608 | 0.6821129 | 582 | 0.6939393 | 0.6886801 | 541 | 0.3010818 | 0.2988002 | 61 |
| 5 | -0.6883164 | -0.6944707 | +579 | +0.6833718 | +0.6780148 | +554 | +0.2964971 | +0.2941730 | +68 |
| 6 | 0.7005756 | 0.7066303 | 574 | 0.6726094 | 0.6671562 | 566 | 0.2918278 | 0.2894619 | 75 |
| 7 | 0.7126346 | 0.7185879 | 570 | 0.6616553 | 0.6561076 | 579 | 0.2870753 | 0.2846684 | 82 |
| 8 | 0.7244897 | 0.7303397 | 565 | 0.6505132 | 0.6448728 | 591 | 0.2822411 | 0.2797938 | 90 |
| 9 | 0.7361373 | 0.7418823 | 560 | 0.6391866 | 0.6334552 | 604 | 0.2773265 | 0.2748396 | 97 |
| 10 | -0.7475740 | -0.7532124 | +555 | +0.6276787 | +0.6218578 | +616 | +0.2723330 | +0.2698072 | +105 |
| 11 | 0.7587967 | 0.7643269 | 550 | 0.6159927 | 0.6100841 | 628 | 0.2672622 | 0.2646983 | 113 |
| 12 | 0.7698024 | 0.7752230 | 544 | 0.6041321 | 0.5981376 | 640 | 0.2621156 | 0.2595145 | 121 |
| 13 | 0.7805882 | 0.7858977 | 537 | 0.5921006 | 0.5860221 | 652 | 0.2568949 | 0.2542573 | 129 |
| 14 | 0.7911510 | 0.7963479 | 530 | 0.5799020 | 0.5737412 | 664 | 0.2516017 | 0.2489284 | 136 |
| 15 | -0.8014879 | -0.8065709 | +523 | +0.5675398 | +0.5612984 | +676 | +0.2462375 | +0.2435293 | +144 |

FOR GREENWICH MEAN NOON AND MIDNIGHT.

| Date. | X True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Y True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Z True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. |
|---------|--------------------|------------|--|--------------------|------------|--|--------------------|------------|--|
| | Noon. | Midnight. | | Noon. | Midnight. | | Noon. | Midnight. | |
| Aug. 16 | -0.8115962 | -0.8165639 | +515 | +0.5550174 | +0.5486970 | +688 | +0.2408038 | +0.2380614 | +152 |
| 17 | 0.8214733 | 0.8263244 | 507 | 0.5423379 | 0.5359404 | 700 | 0.2353022 | 0.2225263 | 160 |
| 18 | 0.8311167 | 0.8358500 | 499 | 0.5295019 | 0.5230319 | 711 | 0.2297341 | 0.2269255 | 167 |
| 19 | 0.8405238 | 0.8451380 | 491 | 0.5165217 | 0.5099749 | 723 | 0.2241010 | 0.2212605 | 175 |
| 20 | 0.8496920 | 0.8541858 | 482 | 0.5033918 | 0.4967730 | 734 | 0.2184044 | 0.2155327 | 182 |
| 21 | -0.8586187 | -0.8629907 | +472 | +0.4901187 | +0.4834295 | +745 | +0.2126457 | +0.2097436 | +190 |
| 22 | 0.8673013 | 0.8715503 | 462 | 0.4767057 | 0.4699476 | 756 | 0.2068264 | 0.2038946 | 198 |
| 23 | 0.8757372 | 0.8798619 | 452 | 0.4631560 | 0.4563309 | 767 | 0.2009480 | 0.1979872 | 206 |
| 24 | 0.8839239 | 0.8879229 | 442 | 0.4494732 | 0.4425829 | 777 | 0.1950121 | 0.1920230 | 213 |
| 25 | 0.8918586 | 0.8957306 | 431 | 0.4356608 | 0.4287072 | 787 | 0.1890200 | 0.1860034 | 221 |
| 26 | -0.8995386 | -0.9032823 | +420 | +0.4217226 | +0.4147074 | +797 | +0.1829733 | +0.1799300 | +229 |
| 27 | 0.9069612 | 0.9105753 | 409 | 0.4076621 | 0.4005872 | 807 | 0.1768736 | 0.1738043 | 237 |
| 28 | 0.9141240 | 0.9176072 | 397 | 0.3934831 | 0.3863504 | 816 | 0.1707224 | 0.1676280 | 244 |
| 29 | 0.9210244 | 0.9243754 | 385 | 0.3791895 | 0.3720011 | 825 | 0.1645214 | 0.1614029 | 252 |
| 30 | 0.9276598 | 0.9308773 | 373 | 0.3647854 | 0.3575433 | 834 | 0.1582725 | 0.1551306 | 259 |
| 31 | -0.9340276 | -0.9371104 | +360 | +0.3502750 | +0.3429812 | +843 | +0.1519773 | +0.1488129 | +267 |
| Sept. 1 | 0.9401255 | 0.9430725 | 347 | 0.3356624 | 0.3283191 | 852 | 0.1456376 | 0.1424516 | 274 |
| 2 | 0.9459512 | 0.9487613 | 334 | 0.3209519 | 0.3135613 | 861 | 0.1392552 | 0.1360486 | 282 |
| 3 | 0.9515026 | 0.9541748 | 320 | 0.3061479 | 0.2987124 | 869 | 0.1328321 | 0.1296060 | 289 |
| 4 | 0.9567778 | 0.9593113 | 306 | 0.2912552 | 0.2837771 | 877 | 0.1263704 | 0.1231258 | 297 |
| 5 | -0.9617752 | -0.9641691 | +292 | +0.2762785 | +0.2687600 | +885 | +0.1198721 | +0.1166098 | +304 |
| 6 | 0.9664930 | 0.9687465 | 278 | 0.2612222 | 0.2536655 | 893 | 0.1133390 | 0.1100601 | 312 |
| 7 | 0.9709296 | 0.9730421 | 263 | 0.2460907 | 0.2384982 | 900 | 0.1067732 | 0.1034787 | 319 |
| 8 | 0.9750838 | 0.9770544 | 248 | 0.2308886 | 0.2232626 | 907 | 0.1001767 | 0.0968677 | 326 |
| 9 | 0.9789539 | 0.9807823 | 233 | 0.2156206 | 0.2079634 | 913 | 0.0935516 | 0.0902290 | 332 |
| 10 | -0.9825393 | -0.9842249 | +218 | +0.2002914 | +0.1926053 | +919 | +0.0869001 | +0.0835651 | +340 |
| 11 | 0.9858390 | 0.9873815 | 202 | 0.1849056 | 0.1771929 | 925 | 0.0802241 | 0.0768775 | 347 |
| 12 | 0.9888523 | 0.9902514 | 186 | 0.1694677 | 0.1617305 | 931 | 0.0735255 | 0.0701683 | 354 |
| 13 | 0.9915786 | 0.9928339 | 170 | 0.1539819 | 0.1462224 | 936 | 0.0668061 | 0.0634393 | 361 |
| 14 | 0.9940170 | 0.9951281 | 154 | 0.1384524 | 0.1306727 | 942 | 0.0600679 | 0.0566924 | 368 |
| 15 | -0.9961669 | -0.9971335 | +137 | +0.1228835 | +0.1150857 | +947 | +0.0533128 | +0.0499295 | +375 |
| 16 | 0.9980277 | 0.9988497 | 120 | 0.1072797 | 0.0994661 | 952 | 0.0465426 | 0.0431526 | 382 |
| 17 | 0.9995991 | 1.0002761 | 103 | 0.0916457 | 0.0838184 | 956 | 0.0397596 | 0.0363637 | 388 |
| 18 | 1.0008804 | 1.0014120 | 86 | 0.0759853 | 0.0681469 | 960 | 0.0329652 | 0.0295645 | 395 |
| 19 | 1.0018707 | 1.0022566 | 68 | 0.0603036 | 0.0524554 | 964 | 0.0261616 | 0.0227568 | 402 |
| 20 | -1.0025695 | -1.0028096 | + 51 | +0.0446033 | +0.0367477 | +968 | +0.0193502 | +0.0159422 | +409 |
| 21 | 1.0029766 | 1.0030706 | 33 | 0.0288890 | 0.0210281 | 971 | 0.0125328 | 0.0091224 | 415 |
| 22 | 1.0030915 | 1.0030391 | + 15 | +0.0131652 | +0.0053012 | 974 | +0.0057113 | +0.0022998 | 421 |
| 23 | 1.0029135 | 1.0027145 | - 3 | -0.0025635 | -0.0104282 | 977 | -0.0011122 | -0.0045241 | 427 |
| 24 | 1.0024420 | 1.0020961 | 21 | 0.0182924 | 0.0261556 | 979 | 0.0079359 | 0.0113472 | 433 |
| 25 | -1.0016765 | -1.0011835 | - 40 | -0.0340170 | -0.0418766 | +981 | -0.0147579 | -0.0181676 | +439 |
| 26 | 1.0006168 | 0.9999765 | 58 | 0.0497333 | 0.0575870 | 983 | 0.0215762 | 0.0249834 | 445 |
| 27 | 0.9992625 | 0.9984748 | 77 | 0.0654368 | 0.0732821 | 984 | 0.0283890 | 0.0317926 | 450 |
| 28 | 0.9976133 | 0.9966781 | 96 | 0.0811223 | 0.0889567 | 985 | 0.0351942 | 0.0385931 | 456 |
| 29 | 0.9956691 | 0.9945865 | 115 | 0.0967847 | 0.1046058 | 986 | 0.0419896 | 0.0453829 | 461 |
| 30 | -0.9934300 | -0.9922000 | -134 | -0.1124193 | -0.1202247 | +986 | -0.0487732 | -0.0521598 | +466 |

FOR GREENWICH MEAN NOON AND MIDNIGHT.

| Date. | X True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Y True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Z True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. |
|--------|--------------------|------------|--|--------------------|------------|--|--------------------|------------|--|
| | Noon. | Midnight. | | Noon. | Midnight. | | Noon. | Midnight. | |
| Oct. 1 | -0.9908961 | -0.9895188 | -154 | -0.1280213 | -0.1358086 | +986 | -0.0553428 | -0.0589216 | +471 |
| 2 | 0.9880678 | 0.9865436 | 173 | 0.1435860 | 0.1513527 | 986 | 0.0622962 | 0.0656661 | 476 |
| 3 | 0.9849459 | 0.9832751 | 193 | 0.1591083 | 0.1668519 | 986 | 0.0690313 | 0.0723913 | 480 |
| 4 | 0.9815312 | 0.9797143 | 213 | 0.1745831 | 0.1823012 | 986 | 0.0757460 | 0.0790950 | 484 |
| 5 | 0.9778246 | 0.9758621 | 233 | 0.1900054 | 0.1976955 | 985 | 0.0824380 | 0.0857749 | 488 |
| 6 | -0.9738271 | -0.9717195 | -253 | -0.2053705 | -0.2130301 | +984 | -0.0891053 | -0.0924290 | +492 |
| 7 | 0.9695307 | 0.9672877 | 273 | 0.2206735 | 0.2283002 | 982 | 0.0957456 | 0.0990550 | 496 |
| 8 | 0.9649637 | 0.9625679 | 293 | 0.2359097 | 0.2435011 | 980 | 0.1023568 | 0.1056509 | 500 |
| 9 | 0.9601005 | 0.9575618 | 313 | 0.2510741 | 0.2586279 | 978 | 0.1089369 | 0.1122146 | 504 |
| 10 | 0.9549518 | 0.9522710 | 333 | 0.2661621 | 0.2736762 | 976 | 0.1154837 | 0.1187441 | 508 |
| 11 | -0.9495195 | -0.9466975 | -354 | -0.2811695 | -0.2886417 | +973 | -0.1219953 | -0.1252373 | +511 |
| 12 | 0.9438053 | 0.9408430 | 374 | 0.2960921 | 0.3035203 | 970 | 0.1284700 | 0.1316930 | 514 |
| 13 | 0.9378109 | 0.9347092 | 395 | 0.3109256 | 0.3183076 | 967 | 0.1349060 | 0.1381088 | 517 |
| 14 | 0.9315381 | 0.9282978 | 415 | 0.3256655 | 0.3329991 | 963 | 0.1413012 | 0.1444829 | 520 |
| 15 | 0.9249884 | 0.9216103 | 436 | 0.3403075 | 0.3475906 | 959 | 0.1476537 | 0.1508134 | 523 |
| 16 | -0.9181636 | -0.9146487 | -457 | -0.3548477 | -0.3620783 | +955 | -0.1539618 | -0.1570987 | +526 |
| 17 | 0.9110657 | 0.9074151 | 478 | 0.3692819 | 0.3764579 | 950 | 0.1602239 | 0.1633371 | 528 |
| 18 | 0.9036968 | 0.8999114 | 499 | 0.3836058 | 0.3907252 | 945 | 0.1664381 | 0.1695267 | 530 |
| 19 | 0.8960587 | 0.8921393 | 520 | 0.3978155 | 0.4048764 | 940 | 0.1726027 | 0.1756658 | 532 |
| 20 | 0.8881530 | 0.8841003 | 541 | 0.4119071 | 0.4189074 | 934 | 0.1787159 | 0.1817528 | 534 |
| 21 | -0.8799812 | -0.8757962 | -562 | -0.4258766 | -0.4328142 | +928 | -0.1847762 | -0.1877859 | +535 |
| 22 | 0.8715452 | 0.8672290 | 583 | 0.4397196 | 0.4465924 | 922 | 0.1907817 | 0.1937633 | 537 |
| 23 | 0.8628473 | 0.8584009 | 604 | 0.4534319 | 0.4602377 | 916 | 0.1967305 | 0.1996831 | 538 |
| 24 | 0.8538897 | 0.8493140 | 625 | 0.4670092 | 0.4737458 | 910 | 0.2026208 | 0.2055434 | 539 |
| 25 | 0.8446743 | 0.8399705 | 646 | 0.4804470 | 0.4871123 | 903 | 0.2084508 | 0.2113425 | 539 |
| 26 | -0.8352033 | -0.8303727 | -667 | -0.4937411 | -0.5003328 | +896 | -0.2142126 | -0.2170785 | +540 |
| 27 | 0.8254792 | 0.8205229 | 689 | 0.5068869 | 0.5134029 | 888 | 0.2199222 | 0.2227494 | 540 |
| 28 | 0.8155044 | 0.8104238 | 710 | 0.5198801 | 0.5263183 | 880 | 0.2255597 | 0.2283531 | 540 |
| 29 | 0.8052816 | 0.8000781 | 731 | 0.5327167 | 0.5390750 | 872 | 0.2311294 | 0.2338883 | 541 |
| 30 | 0.7948136 | 0.7894887 | 752 | 0.5453926 | 0.5516688 | 864 | 0.2366295 | 0.2393528 | 541 |
| 31 | -0.7841035 | -0.7786587 | -774 | -0.5579033 | -0.5640953 | +855 | -0.2420581 | -0.2447449 | +540 |
| Nov. 1 | 0.7731543 | 0.7675912 | 795 | 0.5702443 | 0.5763499 | 846 | 0.2474132 | 0.2500626 | 539 |
| 2 | 0.7619694 | 0.7562897 | 816 | 0.5824115 | 0.5884286 | 836 | 0.2526929 | 0.2553040 | 538 |
| 3 | 0.7505522 | 0.7447577 | 837 | 0.5944008 | 0.6003275 | 826 | 0.2578954 | 0.2604673 | 537 |
| 4 | 0.7389064 | 0.7329990 | 859 | 0.6062084 | 0.6120428 | 816 | 0.2630192 | 0.2655508 | 535 |
| 5 | -0.7270358 | -0.7210175 | -880 | -0.6178303 | -0.6235705 | +805 | -0.2680620 | -0.2705528 | +533 |
| 6 | 0.7149443 | 0.7088170 | 901 | 0.6292629 | 0.6349071 | 794 | 0.2730227 | 0.2754717 | 531 |
| 7 | 0.7026358 | 0.6964012 | 922 | 0.6405026 | 0.6460490 | 783 | 0.2778995 | 0.2803060 | 529 |
| 8 | 0.6901137 | 0.6837741 | 943 | 0.6515459 | 0.6569928 | 771 | 0.2826911 | 0.2850544 | 527 |
| 9 | 0.6773825 | 0.6709398 | 964 | 0.6623895 | 0.6677354 | 759 | 0.2873959 | 0.2897153 | 525 |
| 10 | -0.6644462 | -0.6579022 | -985 | -0.6730303 | -0.6782737 | +747 | -0.2920125 | -0.2942874 | +522 |
| 11 | 0.6513083 | 0.6446653 | 1006 | 0.6834652 | 0.6886046 | 734 | 0.2965397 | 0.2987694 | 519 |
| 12 | 0.6379733 | 0.6312331 | 1026 | 0.6936914 | 0.6987251 | 721 | 0.3009762 | 0.3031600 | 516 |
| 13 | 0.6244449 | 0.6176096 | 1047 | 0.7037055 | 0.7086324 | 708 | 0.3053206 | 0.3074579 | 513 |
| 14 | 0.6107272 | 0.6037987 | 1068 | 0.7135051 | 0.7183235 | 694 | 0.3095718 | 0.3116620 | 509 |
| 15 | -0.5968242 | -0.5898045 | -1089 | -0.7230873 | -0.7277957 | +680 | -0.3137284 | -0.3157710 | +505 |

FOR GREENWICH MEAN NOON AND MIDNIGHT.

| Date. | X True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. | Y True Equinox | | Reduc. to Mean Eq'x of Jan. 0. | Z True Equinox. | | Reduc. to Mean Eq'x of Jan. 0. |
|---------|--------------------|------------|--|-------------------|------------|--|--------------------|------------|--|
| | Noon. | Midnight. | | Noon. | Midnight. | | Noon. | Midnight. | |
| Nov. 16 | -0.5827398 | -0.5756308 | -1109 | -0.7324485 | -0.7370457 | +665 | -0.3177893 | -0.3197836 | +501 |
| 17 | 0.5684777 | 0.5612813 | 1129 | 0.7415867 | 0.7460713 | 650 | 0.3217534 | 0.3236988 | 497 |
| 18 | 0.5540417 | 0.5467598 | 1149 | 0.7504989 | 0.7548695 | 635 | 0.3256195 | 0.3275154 | 492 |
| 19 | 0.5394357 | 0.5320704 | 1169 | 0.7591824 | 0.7634375 | 620 | 0.3293864 | 0.3312323 | 487 |
| 20 | 0.5246640 | 0.5172175 | 1188 | 0.7676342 | 0.7717724 | 604 | 0.3330528 | 0.3348482 | 482 |
| 21 | -0.5097310 | -0.5022053 | -1208 | -0.7758516 | -0.7798714 | +587 | -0.3366177 | -0.3383618 | +477 |
| 22 | 0.4946407 | 0.4870379 | 1227 | 0.7838315 | 0.7877318 | 570 | 0.3400798 | 0.3417720 | 471 |
| 23 | 0.4793972 | 0.4717193 | 1247 | 0.7915716 | 0.7953509 | 553 | 0.3434379 | 0.3450777 | 466 |
| 24 | 0.4640046 | 0.4562538 | 1266 | 0.7990690 | 0.8027259 | 535 | 0.3466909 | 0.3482777 | 460 |
| 25 | 0.4484674 | 0.4406461 | 1285 | 0.8063210 | 0.8098540 | 517 | 0.3498376 | 0.3513707 | 454 |
| 26 | -0.4327903 | -0.4249010 | -1303 | -0.8133246 | -0.8167325 | +499 | -0.3528766 | -0.3543554 | +447 |
| 27 | 0.4169784 | 0.4090234 | 1321 | 0.8200772 | 0.8233587 | 480 | 0.3558068 | 0.3572308 | 441 |
| 28 | 0.4010364 | 0.3930182 | 1339 | 0.8265764 | 0.8297302 | 461 | 0.3586272 | 0.3599959 | 434 |
| 29 | 0.3849692 | 0.3768903 | 1357 | 0.8328197 | 0.8358447 | 442 | 0.3613367 | 0.3626496 | 427 |
| 30 | 0.3687819 | 0.3606450 | 1375 | 0.8388049 | 0.8417000 | 422 | 0.3639342 | 0.3651908 | 420 |
| Dec. 1 | -0.3524799 | -0.3442877 | -1392 | -0.8445298 | -0.8472940 | +402 | -0.3664188 | -0.3676185 | +413 |
| 2 | 0.3360687 | 0.3278238 | 1409 | 0.8499924 | 0.8526248 | 382 | 0.3687895 | 0.3699319 | 405 |
| 3 | 0.3195535 | 0.3112586 | 1426 | 0.8551910 | 0.8576906 | 361 | 0.3710455 | 0.3721302 | 397 |
| 4 | 0.3029397 | 0.2945976 | 1442 | 0.8601236 | 0.8624897 | 340 | 0.3731860 | 0.3742127 | 389 |
| 5 | 0.2862328 | 0.2778462 | 1458 | 0.8647887 | 0.8670206 | 318 | 0.3752103 | 0.3761787 | 381 |
| 6 | -0.2694382 | -0.2610098 | -1474 | -0.8691851 | -0.8712820 | +296 | -0.3771179 | -0.3780277 | +373 |
| 7 | 0.2525614 | 0.2440939 | 1490 | 0.8733112 | 0.8752726 | 274 | 0.3789081 | 0.3797590 | 364 |
| 8 | 0.2356079 | 0.2271040 | 1505 | 0.8771661 | 0.8789915 | 251 | 0.3805804 | 0.3813723 | 355 |
| 9 | 0.2185829 | 0.2100453 | 1520 | 0.8807488 | 0.8824378 | 228 | 0.3821345 | 0.3828672 | 346 |
| 10 | 0.2014918 | 0.1929232 | 1534 | 0.8840535 | 0.8856107 | 204 | 0.3835701 | 0.3842434 | 337 |
| 11 | -0.1843400 | -0.1757430 | -1548 | -0.8870945 | -0.8885096 | +180 | -0.3848868 | -0.3855005 | +327 |
| 12 | 0.1671326 | 0.1585097 | 1562 | 0.8898561 | 0.8911337 | 156 | 0.3860843 | 0.3866383 | 317 |
| 13 | 0.1498746 | 0.1412283 | 1575 | 0.8923425 | 0.8934823 | 131 | 0.3871624 | 0.3876565 | 307 |
| 14 | 0.1325711 | 0.1239039 | 1588 | 0.8945531 | 0.8955548 | 106 | 0.3881208 | 0.3885550 | 297 |
| 15 | 0.1152271 | 0.1065415 | 1600 | 0.8964872 | 0.8973505 | 81 | 0.3889593 | 0.3893335 | 287 |
| 16 | -0.0978475 | -0.0891461 | -1612 | -0.8981444 | -0.8988690 | + 55 | -0.3896777 | -0.3899918 | +276 |
| 17 | 0.0804375 | 0.0717229 | 1624 | 0.8995241 | 0.9001097 | 29 | 0.3902757 | 0.3905296 | 266 |
| 18 | 0.0630023 | 0.0542767 | 1635 | 0.9006256 | 0.9010718 | + 3 | 0.3907532 | 0.3909467 | 255 |
| 19 | 0.0455465 | 0.0368125 | 1645 | 0.9014483 | 0.9017549 | - 23 | 0.3911099 | 0.3912429 | 244 |
| 20 | 0.0280752 | 0.0193355 | 1655 | 0.9019917 | 0.9021585 | 50 | 0.3913456 | 0.3914181 | 233 |
| 21 | -0.0105938 | -0.0018512 | -1665 | -0.9022555 | -0.9022824 | - 77 | -0.3914602 | -0.3914721 | +222 |
| 22 | +0.0068920 | +0.0156349 | 1674 | 0.9022393 | 0.9021261 | 104 | 0.3914535 | 0.3914046 | 210 |
| 23 | 0.0243771 | 0.0331177 | 1683 | 0.9019428 | 0.9016893 | 132 | 0.3913253 | 0.3912155 | 198 |
| 24 | 0.0418562 | 0.0505919 | 1691 | 0.9013655 | 0.9009715 | 160 | 0.3910753 | 0.3909046 | 186 |
| 25 | 0.0593241 | 0.0680520 | 1699 | 0.9005072 | 0.8999726 | 188 | 0.3907035 | 0.3904719 | 174 |
| 26 | +0.0767750 | +0.0854923 | -1706 | -0.8993677 | -0.8986926 | -216 | -0.3902099 | -0.3899174 | +162 |
| 27 | 0.0942032 | 0.1029070 | 1712 | 0.8979472 | 0.8971318 | 245 | 0.3895944 | 0.3892410 | 150 |
| 28 | 0.1116031 | 0.1202905 | 1718 | 0.8962462 | 0.8952907 | 274 | 0.3888571 | 0.3884429 | 137 |
| 29 | 0.1289688 | 0.1376371 | 1723 | 0.8942651 | 0.8931696 | 303 | 0.3879982 | 0.3875232 | 125 |
| 30 | 0.1462946 | 0.1549408 | 1728 | 0.8920042 | 0.8907690 | 332 | 0.3870178 | 0.3864821 | 112 |
| 31 | +0.1635747 | +0.1721959 | -1732 | -0.8894640 | -0.8880895 | -361 | -0.3859161 | -0.3853199 | + 99 |
| 32 | +0.1808034 | +0.1893967 | -1735 | -0.8866454 | -0.8851321 | -391 | -0.3846935 | -0.3840371 | + 86 |

FOR GREENWICH MEAN NOON AND MIDNIGHT.

| Day of Month. | JANUARY. | | Day of Month. | FEBRUARY. | | Day of Month. | MARCH. | |
|---------------------|-----------------|--------------|---------------------|-----------------|-------------|---------------------|-----------------|--------------|
| | True Longitude. | Latitude. | | True Longitude. | Latitude. | | True Longitude. | Latitude. |
| 1.0 | 169° 40' 14.9" | +5° 12' 5.3" | 1.0 | 214° 24' 16.7" | +3° 9' 7.5" | 1.0 | 223° 28' 37.6" | +2° 13' 6.3" |
| 1.5 | 175 37 44.3 | 5 7 24.1 | 1.5 | 220 38 0.2 | 2 41 57.4 | 1.5 | 229 42 22.8 | 1 42 53.8 |
| 2.0 | 181 36 55.8 | 4 59 21.2 | 2.0 | 226 56 26.0 | 2 12 28.7 | 2.0 | 236 0 3.6 | 1 11 5.8 |
| 2.5 | 187 38 24.1 | 4 47 57.7 | 2.5 | 233 20 9.8 | 1 40 56.2 | 2.5 | 242 22 12.3 | 0 38 1.1 |
| 3.0 | 193 42 44.7 | 4 33 16.0 | 3.0 | 239 49 46.0 | 1 7 37.3 | 3.0 | 248 49 21.4 | +0 4 0.5 |
| 3.5 | 199 50 33.8 | +4 15 19.4 | 3.5 | 246 25 45.5 | +0 32 52.6 | 3.5 | 255 22 2.3 | -0 30 32.4 |
| 4.0 | 206 2 27.1 | 3 54 12.6 | 4.0 | 253 8 35.0 | -0 2 53.7 | 4.0 | 262 0 44.7 | 1 5 12.0 |
| 4.5 | 212 18 59.1 | 3 30 2.4 | 4.5 | 259 58 34.9 | 0 39 13.8 | 4.5 | 268 45 54.2 | 1 39 29.8 |
| 5.0 | 218 40 42.7 | 3 2 57.7 | 5.0 | 266 55 57.6 | 1 15 36.0 | 5.0 | 275 37 51.6 | 2 12 54.9 |
| 5.5 | 225 8 7.9 | 2 33 10.4 | 5.5 | 274 0 45.4 | 1 51 24.7 | 5.5 | 282 36 49.8 | 2 44 53.9 |
| 6.0 | 231 41 40.3 | +2 0 55.4 | 6.0 | 281 12 48.7 | -2 26 1.3 | 6.0 | 289 42 52.6 | -3 14 51.3 |
| 6.5 | 238 21 40.4 | 1 26 31.5 | 6.5 | 288 31 45.0 | 2 58 44.6 | 6.5 | 296 55 52.8 | 3 42 10.7 |
| 7.0 | 245 8 21.8 | 0 50 21.8 | 7.0 | 295 56 57.7 | 3 28 52.8 | 7.0 | 304 15 30.2 | 4 6 15.5 |
| 7.5 | 252 1 50.4 | +0 12 53.9 | 7.5 | 303 27 35.7 | 3 55 44.4 | 7.5 | 311 41 10.4 | 4 26 30.3 |
| 8.0 | 259 2 2.6 | -0 25 20.1 | 8.0 | 311 2 34.6 | 4 18 40.7 | 8.0 | 319 12 5.0 | 4 42 23.2 |
| 8.5 | 266 8 44.6 | -1 3 43.9 | 8.5 | 318 40 39.2 | -4 37 8.3 | 8.5 | 326 47 12.1 | -4 53 27.1 |
| 9.0 | 273 21 31.8 | 1 41 36.8 | 9.0 | 326 20 25.4 | 4 50 40.2 | 9.0 | 334 25 17.7 | 4 59 21.8 |
| 9.5 | 280 39 48.4 | 2 18 16.4 | 9.5 | 334 0 25.1 | 4 58 58.0 | 9.5 | 342 4 59.0 | 4 59 55.2 |
| 10.0 | 288 2 47.9 | 2 52 58.6 | 10.0 | 341 39 8.9 | 5 1 52.9 | 10.0 | 349 44 47.9 | 4 55 4.9 |
| 10.5 | 295 29 34.0 | 3 24 59.9 | 10.5 | 349 15 12.3 | 4 59 25.5 | 10.5 | 357 23 15.1 | 4 44 58.0 |
| 11.0 | 302 59 2.7 | -3 53 39.5 | 11.0 | 356 47 18.1 | -4 51 45.7 | 11.0 | 4 58 54.7 | -4 29 50.8 |
| 11.5 | 310 30 4.6 | 4 18 21.0 | 11.5 | 4 14 20.2 | 4 39 11.6 | 11.5 | 12 30 27.8 | 4 10 8.0 |
| 12.0 | 318 1 27.6 | 4 38 34.0 | 12.0 | 11 35 25.8 | 4 22 7.9 | 12.0 | 19 56 46.9 | 3 46 20.8 |
| 12.5 | 325 32 0.0 | 4 53 55.9 | 12.5 | 18 49 56.2 | 4 1 4.1 | 12.5 | 27 16 56.6 | 3 19 4.8 |
| 13.0 | 333 0 33.7 | 5 4 12.0 | 13.0 | 25 57 26.9 | 3 36 32.5 | 13.0 | 34 30 16.1 | 2 48 58.9 |
| 13.5 | 340 26 7.5 | -5 9 16.2 | 13.5 | 32 57 46.7 | -3 9 7.0 | 13.5 | 41 36 19.1 | -2 16 41.8 |
| 14.0 | 347 47 48.1 | 5 9 10.2 | 14.0 | 39 50 56.4 | 2 39 21.6 | 14.0 | 48 34 52.8 | 1 42 52.2 |
| 14.5 | 355 4 52.0 | 5 4 3.3 | 14.5 | 46 37 6.8 | 2 7 49.4 | 14.5 | 55 25 57.0 | 1 8 6.4 |
| 15.0 | 2 16 46.8 | 4 54 10.6 | 15.0 | 53 16 37.1 | 1 35 2.0 | 15.0 | 62 9 42.0 | -0 32 58.0 |
| 15.5 | 9 23 10.9 | 4 39 52.3 | 15.5 | 59 49 52.4 | 1 1 28.9 | 15.5 | 68 46 27.2 | +0 2 2.5 |
| 16.0 | 16 23 52.6 | -4 21 32.2 | 16.0 | 66 17 22.1 | -0 27 37.4 | 16.0 | 75 16 38.8 | +0 36 27.8 |
| 16.5 | 23 18 49.5 | 3 59 36.4 | 16.5 | 72 39 38.3 | +0 6 7.1 | 16.5 | 81 40 47.7 | 1 9 54.0 |
| 17.0 | 30 8 6.6 | 3 34 32.7 | 17.0 | 78 57 14.3 | 0 39 21.4 | 17.0 | 87 59 28.7 | 1 42 0.1 |
| 17.5 | 36 51 55.2 | 3 6 49.6 | 17.5 | 85 10 43.7 | 1 11 44.2 | 17.5 | 94 13 18.1 | 2 12 27.8 |
| 18.0 | 43 30 31.7 | 2 36 55.5 | 18.0 | 91 20 39.2 | 1 42 56.1 | 18.0 | 100 22 53.4 | 2 41 1.1 |
| 18.5 | 50 4 15.6 | -2 5 18.6 | 18.5 | 97 27 32.3 | +2 12 38.9 | 18.5 | 106 28 51.8 | +3 7 25.7 |
| 19.0 | 56 33 28.5 | 1 32 26.4 | 19.0 | 103 31 52.2 | 2 40 36.3 | 19.0 | 112 31 49.3 | 3 31 29.5 |
| 19.5 | 62 58 33.4 | 0 58 45.6 | 19.5 | 109 34 5.3 | 3 6 33.0 | 19.5 | 118 32 20.7 | 3 53 1.3 |
| 20.0 | 69 19 53.3 | -0 24 42.0 | 20.0 | 115 34 35.8 | 3 30 15.2 | 20.0 | 124 30 58.2 | 4 11 51.6 |
| 20.5 | 75 37 49.7 | +0 9 19.9 | 20.5 | 121 33 45.1 | 3 51 30.2 | 20.5 | 130 28 12.0 | 4 27 51.9 |
| 21.0 | 81 52 43.4 | +0 42 56.5 | 21.0 | 127 31 51.9 | +4 10 6.7 | 21.0 | 136 24 29.5 | +4 40 54.6 |
| 21.5 | 88 4 53.7 | 1 15 45.2 | 21.5 | 133 29 12.4 | 4 25 54.7 | 21.5 | 142 20 15.0 | 4 50 53.4 |
| 22.0 | 94 14 37.8 | 1 47 24.9 | 22.0 | 139 26 0.3 | 4 38 45.8 | 22.0 | 148 15 50.4 | 4 57 42.9 |
| 22.5 | 100 22 11.2 | 2 17 35.9 | 22.5 | 145 22 27.8 | 4 48 32.9 | 22.5 | 154 11 35.0 | 5 1 19.4 |
| 23.0 | 106 27 47.5 | 2 45 59.7 | 23.0 | 151 18 45.5 | 4 55 10.5 | 23.0 | 160 7 44.6 | 5 1 40.1 |
| 23.5 | 112 31 38.6 | +3 12 19.5 | 23.5 | 157 15 2.9 | +4 58 34.9 | 23.5 | 166 4 33.9 | +4 58 43.7 |
| 24.0 | 118 33 55.4 | 3 36 19.9 | 24.0 | 163 11 29.5 | 4 58 43.9 | 24.0 | 172 2 14.9 | 4 52 30.8 |
| 24.5 | 124 34 47.6 | 3 57 47.5 | 24.5 | 169 8 14.2 | 4 55 37.0 | 24.5 | 178 0 58.2 | 4 43 3.2 |
| 25.0 | 130 34 24.6 | 4 16 30.7 | 25.0 | 175 5 27.0 | 4 49 15.6 | 25.0 | 184 0 53.3 | 4 30 25.1 |
| 25.5 | 136 32 55.5 | 4 32 19.5 | 25.5 | 181 3 18.8 | 4 39 42.6 | 25.5 | 190 2 8.9 | 4 14 42.0 |
| 26.0 | 142 30 30.0 | +4 45 5.8 | 26.0 | 187 2 1.9 | +4 27 2.6 | 26.0 | 196 4 53.7 | +3 56 1.7 |
| 26.5 | 148 27 18.9 | 4 54 43.3 | 26.5 | 193 1 50.7 | 4 11 21.8 | 26.5 | 202 9 16.5 | 3 34 33.9 |
| 27.0 | 154 23 33.9 | 5 1 7.8 | 27.0 | 199 3 2.1 | 3 52 47.9 | 27.0 | 208 15 26.8 | 3 10 30.0 |
| 27.5 | 160 19 28.7 | 5 4 16.2 | 27.5 | 205 5 55.3 | 3 31 30.0 | 27.5 | 214 23 35.5 | 2 44 3.5 |
| 28.0 | 166 15 18.8 | 5 4 7.1 | 28.0 | 211 10 52.0 | 3 7 38.8 | 28.0 | 220 33 55.0 | 2 15 29.6 |
| 28.5 | 172 11 22.3 | 5 0 40.7 | 28.5 | 217 18 17.1 | 2 41 26.4 | 28.5 | 226 46 39.4 | 1 45 5.4 |
| 29.0 | 178 7 59.6 | +4 53 58.6 | 29.0 | 223 28 37.6 | +2 13 6.3 | 29.0 | 233 2 4.8 | +1 13 9.5 |
| 29.5 | 184 5 34.2 | 4 44 3.4 | 29.5 | 229 42 22.8 | 1 42 53.8 | 29.5 | 239 20 29.3 | 0 40 2.3 |
| 30.0 | 190 4 31.9 | 4 30 59.0 | 30.0 | 236 0 3.6 | 1 11 5.8 | 30.0 | 245 42 12.7 | +0 6 5.5 |
| 30.5 | 196 5 20.9 | 4 14 50.3 | 30.5 | 242 22 12.3 | 0 38 1.1 | 30.5 | 252 7 36.2 | -0 28 17.3 |
| 31.0 | 202 8 32.3 | 3 55 43.6 | 31.0 | 248 49 21.4 | +0 4 0.5 | 31.0 | 258 37 2.0 | 1 2 41.3 |
| 31.5 | 208 14 39.3 | +3 33 46.4 | 31.5 | 255 22 2.3 | -0 30 32.4 | 31.5 | 265 10 52.7 | -1 36 40.1 |

MOON'S LONGITUDE AND LATITUDE, 1891. 273

FOR GREENWICH MEAN NOON AND MIDNIGHT.

| Day of Month. | APRIL. | | Day of Month. | MAY. | | Day of Month. | JUNE. | |
|---------------|-----------------|------------|---------------|-----------------|------------|---------------|-----------------|------------|
| | True Longitude. | Latitude. | | True Longitude. | Latitude. | | True Longitude. | Latitude. |
| 1.0 | 271 49 29.9 | -2 9 45.9 | 1.0 | 309 47 53.2 | -4 42 59.4 | 1.0 | 3 25 38.5 | -4 39 41.8 |
| 1.5 | 274 33 13.6 | 2 41 29.8 | 1.5 | 316 50 46.9 | 4 57 33.9 | 1.5 | 10 32 34.4 | 4 19 9.8 |
| 2.0 | 285 22 21.0 | 3 11 21.7 | 2.0 | 323 57 9.1 | 5 7 43.1 | 2.0 | 17 38 35.4 | 3 54 41.5 |
| 2.5 | 292 17 4.4 | 3 33 50.8 | 2.5 | 331 6 44.5 | 5 13 11.0 | 2.5 | 24 43 19.1 | 3 26 41.9 |
| 3.0 | 299 17 30.1 | 4 3 26.2 | 3.0 | 338 19 11.6 | 5 13 46.2 | 3.0 | 31 46 22.5 | 2 55 39.8 |
| 3.5 | 306 23 37.0 | -1 24 37.4 | 3.5 | 345 34 3.1 | -5 9 22.6 | 3.5 | 38 47 22.7 | 2 22 7.3 |
| 4.0 | 313 35 15.0 | 4 41 55.2 | 4.0 | 352 50 45.9 | 4 59 59.9 | 4.0 | 45 45 57.1 | 1 46 38.7 |
| 4.5 | 320 52 3.8 | 4 54 53.3 | 4.5 | 0 8 41.5 | 4 45 44.6 | 4.5 | 52 41 43.6 | 1 9 49.6 |
| 5.0 | 324 13 32.2 | 5 3 9.0 | 5.0 | 7 27 6.7 | 4 26 49.4 | 5.0 | 59 34 21.5 | -0 32 16.3 |
| 5.5 | 335 38 58.0 | 5 6 25.0 | 5.5 | 14 45 14.9 | 4 3 33.8 | 5.5 | 66 23 31.7 | +0 5 25.6 |
| 6.0 | 343 7 28.6 | -5 4 30.2 | 6.0 | 22 2 17.9 | -3 36 23.5 | 6.0 | 73 8 57.7 | +0 42 41.6 |
| 6.5 | 350 38 2.3 | 4 57 21.2 | 6.5 | 29 17 27.4 | 3 5 49.6 | 6.5 | 79 50 25.7 | 1 18 59.5 |
| 7.0 | 358 9 31.0 | 4 45 2.8 | 7.0 | 36 29 56.3 | 2 32 27.3 | 7.0 | 86 27 45.1 | 1 53 49.7 |
| 7.5 | 5 40 42.0 | 4 27 48.4 | 7.5 | 43 39 1.1 | 1 56 54.8 | 7.5 | 93 0 49.1 | 2 26 46.0 |
| 8.0 | 13 10 22.0 | 4 5 59.9 | 8.0 | 50 44 2.9 | 1 19 52.0 | 8.0 | 99 29 34.8 | 2 57 25.5 |
| 8.5 | 20 37 20.4 | -3 40 5.5 | 8.5 | 57 44 28.5 | -0 41 58.9 | 8.5 | 105 54 3.4 | +3 25 28.9 |
| 9.0 | 25 0 31.6 | 3 10 40.1 | 9.0 | 64 39 51.6 | -0 3 54.2 | 9.0 | 112 14 20.1 | 3 50 40.6 |
| 9.5 | 35 18 58.0 | 2 38 22.3 | 9.5 | 71 29 53.1 | +0 33 45.7 | 9.5 | 118 30 34.5 | 4 12 48.2 |
| 10.0 | 42 31 52.1 | 2 3 52.9 | 10.0 | 78 14 21.2 | 1 10 27.5 | 10.0 | 124 43 0.0 | 4 31 42.5 |
| 10.5 | 49 33 37.4 | 1 27 53.5 | 10.5 | 84 53 11.5 | 1 45 41.6 | 10.5 | 130 51 54.0 | 4 47 17.0 |
| 11.0 | 56 33 49.0 | -0 51 4.2 | 11.0 | 91 26 26.4 | +2 19 2.3 | 11.0 | 136 57 37.4 | +4 59 27.5 |
| 11.5 | 63 32 13.2 | -0 14 2.8 | 11.5 | 97 54 14.9 | 2 50 8.3 | 11.5 | 143 0 34.2 | 5 8 11.6 |
| 12.0 | 70 18 46.7 | +0 22 36.2 | 12.0 | 104 16 51.9 | 3 18 41.5 | 12.0 | 149 1 11.3 | 5 13 28.8 |
| 12.5 | 76 58 36.0 | 0 58 22.0 | 12.5 | 110 34 36.7 | 3 44 27.6 | 12.5 | 154 59 57.8 | 5 15 19.9 |
| 13.0 | 83 31 55.5 | 1 32 47.8 | 13.0 | 116 47 53.4 | 4 7 15.6 | 13.0 | 160 57 25.1 | 5 13 46.6 |
| 13.5 | 89 59 6.6 | +2 5 30.8 | 13.5 | 122 57 9.4 | +4 26 56.8 | 13.5 | 166 54 6.3 | +5 8 51.6 |
| 14.0 | 96 20 35.9 | 2 36 11.6 | 14.0 | 129 2 54.8 | 4 43 25.0 | 14.0 | 172 50 35.4 | 5 0 38.5 |
| 14.5 | 102 36 54.2 | 3 4 34.1 | 14.5 | 135 5 41.5 | 4 56 35.6 | 14.5 | 178 47 27.3 | 4 49 11.4 |
| 15.0 | 108 48 35.2 | 3 30 25.1 | 15.0 | 141 6 3.3 | 5 6 25.6 | 15.0 | 184 45 17.2 | 4 34 35.3 |
| 15.5 | 114 56 14.1 | 3 53 33.6 | 15.5 | 147 4 34.4 | 5 12 53.2 | 15.5 | 190 44 40.1 | 4 16 56.2 |
| 16.0 | 121 0 27.2 | +4 13 50.7 | 16.0 | 153 1 49.4 | +5 15 57.5 | 16.0 | 196 46 10.7 | +3 56 21.1 |
| 16.5 | 127 1 50.9 | 4 31 9.1 | 16.5 | 158 58 23.1 | 5 15 38.5 | 16.5 | 202 50 22.1 | 3 32 58.2 |
| 17.0 | 133 1 1.2 | 4 45 22.8 | 17.0 | 164 54 49.1 | 5 11 57.0 | 17.0 | 208 57 45.8 | 3 6 57.6 |
| 17.5 | 138 58 32.9 | 4 56 26.7 | 17.5 | 170 51 40.5 | 5 4 54.7 | 17.5 | 215 8 51.2 | 2 38 30.9 |
| 18.0 | 144 54 59.4 | 5 4 17.1 | 18.0 | 176 49 28.6 | 4 54 34.0 | 18.0 | 221 24 4.8 | 2 7 52.5 |
| 18.5 | 150 50 52.2 | +5 8 50.8 | 18.5 | 182 48 43.2 | +4 40 58.6 | 18.5 | 227 43 49.4 | +1 35 18.8 |
| 19.0 | 156 46 40.5 | 5 10 5.9 | 19.0 | 188 49 52.2 | 4 24 13.3 | 19.0 | 234 8 23.8 | 1 1 9.5 |
| 19.5 | 162 42 51.4 | 5 8 1.1 | 19.5 | 194 53 20.8 | 4 4 24.5 | 19.5 | 240 38 1.8 | +0 25 47.1 |
| 20.0 | 168 39 49.2 | 5 2 36.5 | 20.0 | 200 59 31.8 | 3 41 40.3 | 20.0 | 247 12 52.0 | -0 10 22.8 |
| 20.5 | 174 37 55.9 | 4 53 53.5 | 20.5 | 207 8 45.0 | 3 16 11.0 | 20.5 | 253 52 56.8 | 0 46 51.3 |
| 21.0 | 180 37 30.6 | +4 41 54.6 | 21.0 | 213 21 17.2 | +2 48 9.0 | 21.0 | 260 38 12.5 | -1 23 7.1 |
| 21.5 | 186 38 50.3 | 4 26 44.4 | 21.5 | 219 37 22.2 | 2 17 49.5 | 21.5 | 267 28 28.7 | 1 58 36.5 |
| 22.0 | 192 42 9.3 | 4 8 28.9 | 22.0 | 225 57 10.4 | 1 45 30.1 | 22.0 | 274 23 28.8 | 2 32 44.2 |
| 22.5 | 198 47 39.7 | 3 47 16.4 | 22.5 | 232 20 48.6 | 1 11 31.5 | 22.5 | 281 22 49.6 | 3 4 54.6 |
| 23.0 | 204 55 31.5 | 3 23 17.4 | 23.0 | 238 48 20.6 | 0 36 16.9 | 23.0 | 288 26 2.5 | 3 34 32.4 |
| 23.5 | 211 5 53.3 | +2 56 44.6 | 23.5 | 245 19 47.1 | +0 0 12.3 | 23.5 | 295 32 34.0 | -4 1 4.0 |
| 24.0 | 217 18 52.4 | 2 27 52.9 | 24.0 | 251 55 5.5 | -0 36 13.9 | 24.0 | 302 41 46.6 | 4 23 58.9 |
| 24.5 | 223 34 34.7 | 1 56 59.8 | 24.5 | 258 34 10.4 | 1 12 31.5 | 24.5 | 309 53 0.6 | 4 42 49.9 |
| 25.0 | 229 53 5.7 | 1 24 25.1 | 25.0 | 265 16 53.9 | 1 48 8.7 | 25.0 | 317 5 35.1 | 4 57 15.6 |
| 25.5 | 236 14 30.6 | 0 50 30.4 | 25.5 | 272 3 6.0 | 2 22 33.1 | 25.5 | 324 18 49.6 | 5 6 59.5 |
| 26.0 | 242 34 54.5 | +0 15 39.6 | 26.0 | 278 52 34.6 | -2 55 11.8 | 26.0 | 331 32 5.2 | -5 11 51.5 |
| 26.5 | 249 6 22.8 | -0 19 41.7 | 26.5 | 285 45 6.1 | 3 25 32.9 | 26.5 | 338 44 45.9 | 5 11 47.4 |
| 27.0 | 255 37 1.1 | 0 55 6.5 | 27.0 | 292 40 25.8 | 3 53 5.9 | 27.0 | 345 56 19.4 | 5 6 49.2 |
| 27.5 | 262 10 55.6 | 1 30 6.7 | 27.5 | 299 38 17.8 | 4 17 22.3 | 27.5 | 353 6 17.9 | 4 57 4.7 |
| 28.0 | 268 48 12.6 | 2 4 13.3 | 28.0 | 306 38 25.7 | 4 37 56.2 | 28.0 | 0 14 18.2 | 4 42 46.9 |
| 28.5 | 275 28 58.6 | 2 36 57.1 | 28.5 | 313 40 32.4 | 4 54 25.4 | 28.5 | 7 20 1.7 | 4 24 13.1 |
| 29.0 | 282 13 19.7 | -3 7 48.3 | 29.0 | 320 44 20.7 | -5 6 31.7 | 29.0 | 14 23 14.1 | -4 1 45.1 |
| 29.5 | 289 1 21.2 | 3 36 17.7 | 29.5 | 327 49 32.8 | 5 14 1.0 | 29.5 | 21 23 45.0 | 3 35 47.7 |
| 30.0 | 295 53 6.8 | 4 1 57.2 | 30.0 | 334 55 50.4 | 5 16 44.0 | 30.0 | 28 21 27.1 | 3 6 48.5 |
| 30.5 | 302 48 38.0 | 4 24 19.6 | 30.5 | 342 2 55.2 | 5 14 36.3 | 30.5 | 35 16 15.8 | 2 35 17.1 |
| 31.0 | 309 47 53.2 | 4 42 59.4 | 31.0 | 349 10 28.1 | 5 7 38.6 | 31.0 | 42 8 8.2 | 2 1 44.4 |
| 31.5 | 316 50 41.9 | -1 57 33.9 | 31.5 | 356 18 9.1 | -4 55 56.7 | 31.5 | 48 57 2.7 | -1 26 42.5 |

FOR GREENWICH MEAN NOON AND MIDNIGHT.

| Day of Month. | JULY. | | Day of Month. | AUGUST. | | Day of Month. | SEPTEMBER. | |
|---------------------|-----------------|-------------|---------------------|-----------------|-------------|---------------------|-----------------|--------------|
| | True Longitude. | Latitude. | | True Longitude. | Latitude. | | True Longitude. | Latitude. |
| 1.0 | 42° 8' 8.2 | -2° 1' 44.4 | 1.0 | 91° 52' 48.6 | +2° 25' 5.2 | 1.0 | 138° 24' 46.3 | +4° 53' 39.3 |
| 1.5 | 48 57 2.7 | 1 26 42.5 | 1.5 | 98 13 40.4 | 2 53 40.7 | 1.5 | 144 26 2.7 | 4 58 22.7 |
| 2.0 | 55 42 58.2 | 0 50 43.4 | 2.0 | 104 31 49.4 | 3 19 53.5 | 2.0 | 150 25 55.0 | 4 59 45.8 |
| 2.5 | 62 25 53.7 | -0 14 19.3 | 2.5 | 110 47 23.9 | 3 43 28.0 | 2.5 | 156 24 32.7 | 4 57 49.9 |
| 3.0 | 69 5 48.0 | +0 21 58.6 | 3.0 | 117 0 31.2 | 4 4 10.9 | 3.0 | 162 22 5.0 | 4 52 38.1 |
| 3.5 | 75 42 39.9 | +0 57 40.1 | 3.5 | 123 11 17.3 | +4 21 51.5 | 3.5 | 168 18 41.5 | +4 44 15.1 |
| 4.0 | 82 16 27.6 | 1 32 16.7 | 4.0 | 129 19 47.7 | 4 36 21.1 | 4.0 | 174 14 32.5 | 4 32 47.0 |
| 4.5 | 88 47 9.0 | 2 5 21.9 | 4.5 | 135 26 8.1 | 4 47 33.7 | 4.5 | 180 9 49.4 | 4 18 21.8 |
| 5.0 | 95 14 42.2 | 2 36 32.0 | 5.0 | 141 30 24.6 | 4 55 25.5 | 5.0 | 186 4 45.6 | 4 1 8.6 |
| 5.5 | 101 39 6.0 | 3 5 25.4 | 5.5 | 147 32 44.1 | 4 59 54.8 | 5.5 | 191 59 36.5 | 3 41 17.7 |
| 6.0 | 108 0 19.9 | +3 31 43.7 | 6.0 | 153 33 15.2 | +5 1 2.0 | 6.0 | 197 54 39.7 | +3 19 0.7 |
| 6.5 | 114 18 24.4 | 3 55 11.3 | 6.5 | 159 32 8.5 | 4 58 49.4 | 6.5 | 203 50 15.5 | 2 54 30.1 |
| 7.0 | 120 33 22.0 | 4 15 36.1 | 7.0 | 165 29 36.8 | 4 53 20.8 | 7.0 | 209 46 46.8 | 2 27 59.4 |
| 7.5 | 126 45 17.2 | 4 32 48.2 | 7.5 | 171 25 55.4 | 4 44 41.7 | 7.5 | 215 44 39.6 | 1 59 43.0 |
| 8.0 | 132 54 17.0 | 4 46 40.7 | 8.0 | 177 21 22.5 | 4 32 58.7 | 8.0 | 221 44 22.4 | 1 29 56.2 |
| 8.5 | 139 0 31.3 | +4 57 9.6 | 8.5 | 183 16 19.3 | +4 18 19.5 | 8.5 | 227 46 26.1 | +0 58 55.2 |
| 9.0 | 145 4 12.8 | 5 4 12.3 | 9.0 | 189 11 10.0 | 4 0 53.0 | 9.0 | 233 51 24.2 | +0 26 57.3 |
| 9.5 | 151 5 37.3 | 5 7 49.3 | 9.5 | 195 6 21.7 | 3 40 48.8 | 9.5 | 239 59 51.9 | -0 5 39.1 |
| 10.0 | 157 5 3.7 | 5 8 1.9 | 10.0 | 201 2 24.5 | 3 18 17.2 | 10.0 | 246 12 25.6 | 0 38 34.3 |
| 10.5 | 163 2 54.0 | 5 4 53.3 | 10.5 | 206 59 51.1 | 2 53 29.6 | 10.5 | 252 29 42.2 | 1 11 27.0 |
| 11.0 | 168 59 33.2 | +4 58 27.5 | 11.0 | 212 59 16.4 | +2 26 38.0 | 11.0 | 258 52 18.2 | -1 43 54.3 |
| 11.5 | 174 55 29.3 | 4 48 49.9 | 11.5 | 219 1 17.4 | 1 57 55.8 | 11.5 | 265 20 48.6 | 2 15 31.6 |
| 12.0 | 180 51 12.6 | 4 36 6.7 | 12.0 | 225 6 32.1 | 1 27 37.2 | 12.0 | 271 55 45.1 | 2 45 52.3 |
| 12.5 | 186 47 15.6 | 4 20 24.5 | 12.5 | 231 15 40.1 | 0 55 57.9 | 12.5 | 278 37 35.3 | 3 14 27.8 |
| 13.0 | 192 44 13.1 | 4 1 50.9 | 13.0 | 237 29 20.4 | +0 23 15.5 | 13.0 | 285 26 40.2 | 3 40 48.2 |
| 13.5 | 198 42 41.1 | +3 40 34.6 | 13.5 | 243 48 11.2 | -0 10 10.6 | 13.5 | 292 23 12.6 | -4 4 22.4 |
| 14.0 | 204 43 16.7 | 3 16 44.8 | 14.0 | 250 12 48.9 | 0 43 58.6 | 14.0 | 299 27 15.5 | 4 24 38.7 |
| 14.5 | 210 46 37.6 | 2 50 32.1 | 14.5 | 256 43 45.9 | 1 17 44.4 | 14.5 | 306 38 39.5 | 4 41 6.1 |
| 15.0 | 216 53 21.4 | 2 22 8.3 | 15.0 | 263 21 30.6 | 1 51 0.5 | 15.0 | 313 57 2.4 | 4 53 15.9 |
| 15.5 | 223 4 4.9 | 1 51 47.0 | 15.5 | 270 6 24.2 | 2 23 18.2 | 15.5 | 321 21 47.7 | 5 0 42.5 |
| 16.0 | 229 19 23.3 | +1 19 43.9 | 16.0 | 276 58 40.0 | -2 54 4.7 | 16.0 | 328 52 4.9 | -5 3 5.8 |
| 16.5 | 235 39 49.0 | 0 46 17.0 | 16.5 | 283 58 21.0 | 3 22 46.2 | 16.5 | 336 26 50.2 | 5 0 12.7 |
| 17.0 | 242 5 51.0 | +0 11 47.0 | 17.0 | 291 5 18.7 | 3 48 47.5 | 17.0 | 344 4 49.0 | 4 51 58.4 |
| 17.5 | 248 37 53.5 | -0 23 22.6 | 17.5 | 298 19 12.0 | 4 11 33.7 | 17.5 | 351 44 38.6 | 4 38 27.5 |
| 18.0 | 255 16 14.8 | 0 58 44.9 | 18.0 | 305 39 26.1 | 4 30 30.7 | 18.0 | 359 24 51.9 | 4 19 54.1 |
| 18.5 | 262 1 5.9 | -1 33 50.2 | 18.5 | 313 5 13.0 | -4 45 7.7 | 18.5 | 7 4 1.8 | -3 56 41.5 |
| 19.0 | 268 52 29.3 | 2 8 5.8 | 19.0 | 320 35 32.2 | 4 54 59.1 | 19.0 | 14 40 44.9 | 3 29 21.2 |
| 19.5 | 275 50 17.9 | 2 40 56.7 | 19.5 | 328 9 12.9 | 4 59 45.9 | 19.5 | 22 13 45.6 | 2 58 30.9 |
| 20.0 | 282 54 14.9 | 3 11 46.5 | 20.0 | 335 44 56.9 | 4 59 16.7 | 20.0 | 29 41 58.3 | 2 24 52.7 |
| 20.5 | 290 3 52.9 | 3 39 58.4 | 20.5 | 343 21 22.1 | 4 53 29.4 | 20.5 | 37 4 30.3 | 1 49 10.8 |
| 21.0 | 297 18 34.1 | -4 4 56.4 | 21.0 | 350 57 6.1 | -4 42 31.2 | 21.0 | 44 20 42.2 | -1 12 9.2 |
| 21.5 | 304 37 31.3 | 4 26 7.3 | 21.5 | 358 30 50.5 | 4 26 37.3 | 21.5 | 51 30 7.9 | -0 34 30.5 |
| 22.0 | 311 59 49.6 | 4 43 1.9 | 22.0 | 6 1 23.7 | 4 6 12.0 | 22.0 | 58 32 33.9 | +0 3 5.5 |
| 22.5 | 319 24 27.8 | 4 55 16.4 | 22.5 | 13 27 44.7 | 3 41 44.7 | 22.5 | 65 27 58.4 | 0 40 3.2 |
| 23.0 | 326 50 21.6 | 5 2 33.9 | 23.0 | 20 49 4.2 | 3 13 50.0 | 23.0 | 72 16 28.7 | 1 15 50.9 |
| 23.5 | 334 16 26.0 | -5 4 45.1 | 23.5 | 28 4 45.0 | -2 43 5.1 | 23.5 | 78 58 20.4 | +1 50 1.3 |
| 24.0 | 341 41 38.1 | 5 1 48.5 | 24.0 | 35 14 23.1 | 2 10 8.5 | 24.0 | 85 33 55.3 | 2 22 11.4 |
| 24.5 | 349 4 59.9 | 4 53 50.3 | 24.5 | 42 17 45.9 | 1 35 38.4 | 24.5 | 92 3 39.3 | 2 52 1.8 |
| 25.0 | 356 25 40.2 | 4 41 3.6 | 25.0 | 49 14 51.5 | 1 0 11.5 | 25.0 | 98 28 1.4 | 3 19 16.7 |
| 25.5 | 3 42 56.1 | 4 23 47.9 | 25.5 | 56 5 46.5 | -0 24 22.3 | 25.5 | 104 47 32.2 | 3 43 43.1 |
| 26.0 | 10 56 14.2 | -1 2 27.7 | 26.0 | 62 50 44.9 | +0 11 17.1 | 26.0 | 111 2 43.0 | +4 5 10.8 |
| 26.5 | 18 5 10.1 | 3 37 31.3 | 26.5 | 69 30 5.8 | 0 46 17.6 | 26.5 | 117 14 4.5 | 4 23 31.7 |
| 27.0 | 25 9 28.7 | 3 9 29.4 | 27.0 | 76 4 11.7 | 1 20 13.0 | 27.0 | 123 22 6.8 | 4 38 39.5 |
| 27.5 | 32 9 2.9 | 2 38 54.3 | 27.5 | 82 33 27.6 | 1 52 39.8 | 27.5 | 129 27 18.4 | 4 50 29.7 |
| 28.0 | 39 3 52.6 | 2 6 18.8 | 28.0 | 88 58 19.2 | 2 23 17.3 | 28.0 | 135 30 5.9 | 4 58 59.4 |
| 28.5 | 45 54 3.4 | 1 32 15.7 | 28.5 | 95 19 11.7 | 2 51 47.1 | 28.5 | 141 30 53.6 | 5 4 7.2 |
| 29.0 | 52 39 44.9 | -0 57 17.0 | 29.0 | 101 36 30.3 | +3 17 53.3 | 29.0 | 147 30 3.8 | +5 5 52.7 |
| 29.5 | 59 21 10.2 | -0 21 53.4 | 29.5 | 107 50 38.3 | 3 41 22.1 | 29.5 | 153 27 56.8 | 5 4 17.4 |
| 30.0 | 65 58 33.6 | +0 13 25.5 | 30.0 | 114 1 56.7 | 4 2 1.7 | 30.0 | 159 24 50.5 | 4 59 24.1 |
| 30.5 | 72 32 10.4 | 0 48 11.9 | 30.5 | 120 10 44.8 | 4 19 42.2 | 30.5 | 165 21 0.9 | 4 51 16.0 |
| 31.0 | 79 2 15.9 | 1 21 59.7 | 31.0 | 126 17 19.5 | 4 34 15.8 | 31.0 | 171 16 42.7 | 4 39 59.7 |
| 31.5 | 85 29 4.3 | +1 54 24.8 | 31.5 | 132 21 55.7 | +4 45 36.2 | 31.5 | 177 12 9.3 | +4 25 41.6 |

FOR GREENWICH MEAN NOON AND MIDNIGHT.

| Day of Month. | OCTOBER. | | Day of Month. | NOVEMBER. | | Day of Month. | DECEMBER. | |
|---------------------|-----------------|--------------|---------------------|-----------------|--------------|---------------------|-----------------|--------------|
| | True Longitude. | Latitude. | | True Longitude. | Latitude. | | True Longitude. | Latitude. |
| 1.0 | 171° 16' 42.7 | +4° 39' 59.7 | 1.0 | 215° 46' 10.9 | +1° 50' 18.3 | 1.0 | 249° 9' 52.1 | -1° 10' 54.2 |
| 1.5 | 177 12 9.3 | 4 25 41.6 | 1.5 | 221 49 19.7 | 1 18 26.3 | 1.5 | 255 32 7.8 | 1 44 44.4 |
| 2.0 | 183 7 33.0 | 4 8 30.4 | 2.0 | 227 54 31.6 | 0 45 28.6 | 2.0 | 261 57 58.2 | 2 17 32.8 |
| 2.5 | 189 3 6.0 | 3 48 36.0 | 2.5 | 234 1 57.9 | +0 11 46.1 | 2.5 | 268 27 22.6 | 2 48 51.7 |
| 3.0 | 194 59 0.3 | 3 26 10.0 | 3.0 | 240 11 49.6 | -0 22 19.2 | 3.0 | 275 0 18.2 | 3 18 13.5 |
| 3.5 | 200 55 28.2 | +3 1 25.3 | 3.5 | 246 24 18.0 | -0 56 24.1 | 3.5 | 281 36 40.3 | -3 45 11.0 |
| 4.0 | 206 52 42.9 | 2 31 36.0 | 4.0 | 252 39 34.7 | 1 30 4.5 | 4.0 | 288 16 22.9 | 4 9 18.5 |
| 4.5 | 212 50 59.0 | 2 5 57.6 | 4.5 | 258 57 52.1 | 2 2 55.9 | 4.5 | 294 59 19.0 | 4 30 11.6 |
| 5.0 | 218 50 32.3 | 1 35 46.9 | 5.0 | 265 19 22.8 | 2 34 33.3 | 5.0 | 301 45 20.6 | 4 47 28.3 |
| 5.5 | 224 51 40.4 | 1 4 21.6 | 5.5 | 271 44 20.0 | 3 4 31.5 | 5.5 | 308 34 19.5 | 5 0 49.1 |
| 6.0 | 230 54 42.9 | +0 32 0.3 | 6.0 | 278 12 57.2 | -3 32 25.3 | 6.0 | 315 26 7.0 | -5 9 57.9 |
| 6.5 | 237 0 1.5 | -0 0 57.4 | 6.5 | 284 45 27.9 | 3 57 50.2 | 6.5 | 322 20 34.3 | 5 14 41.7 |
| 7.0 | 243 8 0.0 | 0 34 10.9 | 7.0 | 291 22 5.3 | 4 20 21.9 | 7.0 | 329 17 32.3 | 5 14 51.5 |
| 7.5 | 249 19 3.7 | 1 7 18.8 | 7.5 | 298 3 1.4 | 4 39 37.2 | 7.5 | 336 16 51.6 | 5 10 22.7 |
| 8.0 | 255 33 39.7 | 1 39 58.6 | 8.0 | 304 48 26.7 | 4 55 14.1 | 8.0 | 343 18 22.2 | 5 1 14.7 |
| 8.5 | 261 52 15.8 | -2 11 47.3 | 8.5 | 311 38 29.1 | -5 6 51.8 | 8.5 | 350 21 53.1 | -4 47 31.8 |
| 9.0 | 268 15 21.0 | 2 42 21.0 | 9.0 | 318 33 13.0 | 5 14 12.7 | 9.0 | 357 27 12.4 | 4 20 22.8 |
| 9.5 | 274 43 23.6 | 3 11 14.8 | 9.5 | 325 32 38.6 | 5 17 1.3 | 9.5 | 4 34 5.8 | 4 7 1.5 |
| 10.0 | 281 16 50.4 | 3 38 2.8 | 10.0 | 332 36 40.8 | 5 15 5.9 | 10.0 | 11 42 17.8 | 3 40 46.6 |
| 10.5 | 287 56 5.7 | 4 2 18.6 | 10.5 | 339 45 8.5 | 5 8 18.9 | 10.5 | 18 51 30.2 | 3 11 1.6 |
| 11.0 | 294 41 30.4 | -4 23 35.7 | 11.0 | 346 57 43.6 | -4 56 37.8 | 11.0 | 26 1 21.8 | -2 38 14.4 |
| 11.5 | 301 33 19.6 | 4 41 27.7 | 11.5 | 354 14 1.2 | 4 40 6.4 | 11.5 | 33 11 28.6 | 2 2 57.0 |
| 12.0 | 308 31 42.9 | 4 55 28.6 | 12.0 | 1 33 28.9 | 4 18 54.5 | 12.0 | 40 21 24.2 | 1 25 45.1 |
| 12.5 | 315 36 38.4 | 5 5 14.2 | 12.5 | 8 55 27.2 | 3 53 18.8 | 12.5 | 47 30 39.3 | 0 47 16.6 |
| 13.0 | 322 47 57.6 | 5 10 23.1 | 13.0 | 16 19 10.5 | 3 23 43.3 | 13.0 | 54 38 42.5 | -0 8 11.3 |
| 13.5 | 330 5 19.1 | -5 10 37.4 | 13.5 | 23 43 47.8 | -2 50 38.4 | 13.5 | 61 45 1.2 | +0 30 50.5 |
| 14.0 | 337 28 10.2 | 5 5 45.0 | 14.0 | 31 8 24.6 | 2 14 40.4 | 14.0 | 68 49 1.9 | 1 9 9.2 |
| 14.5 | 344 55 46.5 | 4 55 40.4 | 14.5 | 38 32 4.5 | 1 36 30.4 | 14.5 | 75 50 11.9 | 1 46 7.3 |
| 15.0 | 352 27 12.6 | 4 40 25.5 | 15.0 | 45 53 51.1 | 0 56 52.9 | 15.0 | 82 48 0.1 | 2 21 10.2 |
| 15.5 | 0 1 23.3 | 4 20 11.2 | 15.5 | 53 12 50.3 | -0 16 33.3 | 15.5 | 89 41 57.6 | 2 53 47.2 |
| 16.0 | 7 37 6.5 | -3 55 16.8 | 16.0 | 60 28 11.9 | +0 23 42.9 | 16.0 | 96 31 39.5 | +3 23 31.9 |
| 16.5 | 15 13 5.8 | 3 26 10.3 | 16.5 | 67 39 11.1 | 1 3 12.2 | 16.5 | 103 16 45.3 | 3 50 3.1 |
| 17.0 | 22 48 3.6 | 2 53 27.5 | 17.0 | 74 45 10.2 | 1 41 14.8 | 17.0 | 109 56 59.5 | 4 13 4.4 |
| 17.5 | 30 20 44.7 | 2 17 49.9 | 17.5 | 81 45 39.1 | 2 17 15.5 | 17.5 | 116 32 12.7 | 4 32 24.5 |
| 18.0 | 37 49 59.2 | 1 40 2.9 | 18.0 | 88 40 16.5 | 2 50 44.3 | 18.0 | 123 2 21.6 | 4 47 56.2 |
| 18.5 | 45 14 45.3 | -1 0 54.1 | 18.5 | 95 28 48.8 | +3 21 16.6 | 18.5 | 129 27 28.6 | +4 59 36.7 |
| 19.0 | 52 34 11.2 | -0 21 10.3 | 19.0 | 102 11 11.0 | 3 48 33.6 | 19.0 | 135 47 42.0 | 5 7 26.4 |
| 19.5 | 59 47 36.1 | +0 18 23.6 | 19.5 | 108 47 26.2 | 4 12 21.4 | 19.5 | 142 3 15.7 | 5 11 28.6 |
| 20.0 | 66 54 30.7 | 0 57 6.3 | 20.0 | 115 17 44.1 | 4 32 30.7 | 20.0 | 148 14 29.1 | 5 11 49.0 |
| 20.5 | 73 54 37.1 | 1 34 21.4 | 20.5 | 121 42 20.7 | 4 48 56.5 | 20.5 | 154 21 45.9 | 5 8 34.5 |
| 21.0 | 80 47 48.2 | +2 9 37.7 | 21.0 | 128 1 37.5 | +5 1 36.7 | 21.0 | 160 25 33.6 | +5 1 53.7 |
| 21.5 | 87 34 6.7 | 2 42 29.3 | 21.5 | 134 16 0.2 | 5 10 31.9 | 21.5 | 166 26 23.4 | 4 51 56.1 |
| 22.0 | 94 13 43.3 | 3 12 35.4 | 22.0 | 140 25 58.0 | 5 15 44.8 | 22.0 | 172 24 48.9 | 4 38 51.5 |
| 22.5 | 100 46 55.7 | 3 39 40.2 | 22.5 | 146 32 3.0 | 5 17 19.8 | 22.5 | 178 21 26.1 | 4 22 50.3 |
| 23.0 | 107 14 7.2 | 4 3 31.4 | 23.0 | 152 34 49.1 | 5 15 22.3 | 23.0 | 184 16 52.5 | 4 4 3.2 |
| 23.5 | 113 35 45.1 | +4 24 0.8 | 23.5 | 158 34 51.0 | +5 9 58.7 | 23.5 | 190 11 46.7 | +3 42 41.4 |
| 24.0 | 119 52 19.7 | 4 41 2.8 | 24.0 | 164 32 44.4 | 5 1 16.0 | 24.0 | 196 6 47.0 | 3 18 56.5 |
| 24.5 | 126 4 23.4 | 4 54 34.4 | 24.5 | 170 29 5.1 | 4 49 21.8 | 24.5 | 202 2 32.5 | 2 53 0.7 |
| 25.0 | 132 12 29.3 | 5 4 34.1 | 25.0 | 176 24 27.9 | 4 34 24.3 | 25.0 | 207 59 41.0 | 2 25 6.9 |
| 25.5 | 138 17 11.1 | 5 11 2.4 | 25.5 | 182 19 27.3 | 4 16 32.5 | 25.5 | 213 58 49.2 | 1 55 29.1 |
| 26.0 | 144 19 1.7 | +5 14 1.0 | 26.0 | 188 14 36.1 | +3 55 56.0 | 26.0 | 220 0 32.3 | +1 24 22.6 |
| 26.5 | 150 18 33.7 | 5 13 32.3 | 26.5 | 194 10 25.4 | 3 32 45.4 | 26.5 | 226 5 52.4 | 0 52 4.0 |
| 27.0 | 156 16 17.7 | 5 9 40.0 | 27.0 | 200 7 24.5 | 3 7 12.5 | 27.0 | 232 13 49.4 | +0 18 51.9 |
| 27.5 | 162 12 43.2 | 5 2 28.7 | 27.5 | 206 6 0.6 | 2 39 30.3 | 27.5 | 238 26 18.5 | -0 14 53.3 |
| 28.0 | 168 8 17.6 | 4 52 4.0 | 28.0 | 212 6 38.1 | 2 9 53.1 | 28.0 | 244 43 11.6 | 0 48 49.3 |
| 28.5 | 174 3 26.4 | 4 38 32.5 | 28.5 | 218 9 38.7 | 1 38 37.1 | 28.5 | 251 4 45.2 | 1 22 31.6 |
| 29.0 | 179 58 33.1 | +4 22 1.8 | 29.0 | 224 15 21.5 | +1 6 0.3 | 29.0 | 257 31 10.4 | -1 55 33.9 |
| 29.5 | 185 53 58.9 | 4 2 41.0 | 29.5 | 230 24 2.7 | +0 32 22.3 | 29.5 | 264 2 32.6 | 2 27 28.4 |
| 30.0 | 191 50 3.2 | 3 40 40.4 | 30.0 | 236 35 55.3 | -0 1 55.2 | 30.0 | 270 38 50.9 | 2 57 46.0 |
| 30.5 | 197 47 3.3 | 3 16 11.7 | 30.5 | 242 51 9.4 | 0 36 29.0 | 30.5 | 277 19 58.0 | 3 25 57.2 |
| 31.0 | 203 45 15.3 | 2 49 28.3 | 31.0 | 249 9 52.1 | 1 10 54.2 | 31.0 | 284 5 40.7 | 3 51 32.6 |
| 31.5 | 209 44 53.5 | +2 20 45.0 | 31.5 | 255 32 7.8 | -1 44 44.4 | 31.5 | 290 55 40.1 | -4 14 4.0 |

| FOR GREENWICH MEAN NOON. | | | | | | |
|--------------------------|---|---|--|---|------------------------|----------------|
| Date. | THE MOON'S EQUATOR. | | | ☾ Mean Longitude of the Moon. | Mean Solar Days. | Motion of ☾ |
| | i Inclination to Earth's Equator. | Δ Ascend'g Node on Earth's Equator to Ascending Node on Ecliptic. | Ω' Ascend'g Node on Earth's Equator. | | | |
| Jan. 0 | 23° 4.1 | 256° 33.9 | 356° 22.9 | 159° 37.7 | 0.1 | 1° 19.06 |
| 10 | 23 3.3 | 256 1.6 | 356 23.4 | 291 23.5 | 0.2 | 2 38.12 |
| 20 | 23 2.5 | 255 29.3 | 356 23.9 | 63 9.4 | 0.3 | 3 57.18 |
| 30 | 23 1.7 | 254 57.0 | 356 24.4 | 194 55.2 | 0.4 | 5 16.23 |
| Feb. 9 | 23 0.9 | 254 24.8 | 356 25.0 | 326 41.0 | 0.5 | 6 35.20 |
| | | | | | 0.6 | 7 54.35 |
| 19 | 23 0.1 | 253 52.6 | 356 25.6 | 98 26.9 | 0.7 | 9 13.41 |
| March 1 | 22 59.3 | 253 20.3 | 356 26.2 | 230 12.7 | 0.8 | 10 32.47 |
| 11 | 22 58.5 | 252 48.0 | 356 26.8 | 1 58.5 | 0.9 | 11 51.53 |
| 21 | 22 57.7 | 252 15.6 | 356 27.4 | 133 44.4 | 1.0 | 13 10.58 |
| 31 | 22 56.9 | 251 43.3 | 356 28.0 | 265 30.2 | 2.0 | 26 21.17 |
| | | | | | 3.0 | 39 31.75 |
| April 10 | 22 56.2 | 251 10.9 | 356 28.7 | 37 16.1 | 4.0 | 52 42.33 |
| 20 | 22 55.4 | 250 38.5 | 356 29.4 | 169 1.9 | 5.0 | 65 52.92 |
| 30 | 22 54.6 | 250 6.1 | 356 30.1 | 300 47.7 | 6.0 | 79 3.50 |
| May 10 | 22 53.9 | 249 33.7 | 356 30.9 | 72 33.6 | 7.0 | 92 14.09 |
| 20 | 22 53.1 | 249 1.3 | 356 31.6 | 204 19.4 | 8.0 | 105 24.67 |
| | | | | | 9.0 | 118 35.25 |
| 30 | 22 52.4 | 248 28.8 | 356 32.4 | 336 5.2 | 10.0 | 131 45.84 |
| June 9 | 22 51.6 | 247 56.3 | 356 33.2 | 107 51.1 | | |
| 19 | 22 50.9 | 247 23.8 | 356 34.0 | 239 36.9 | Hours. | |
| 29 | 22 50.1 | 246 51.3 | 356 34.8 | 11 22.7 | 1 | 0 32.94 |
| July 9 | 22 49.4 | 246 18.8 | 356 35.6 | 143 8.6 | 2 | 1 5.88 |
| | | | | | 3 | 1 38.82 |
| 19 | 22 48.6 | 245 46.2 | 356 36.5 | 274 54.4 | 4 | 2 11.76 |
| 29 | 22 47.9 | 245 13.6 | 356 37.4 | 46 40.3 | 5 | 2 44.70 |
| Aug. 8 | 22 47.2 | 244 41.0 | 356 38.3 | 178 26.1 | 6 | 3 17.65 |
| 18 | 22 46.4 | 244 8.1 | 356 39.2 | 310 11.9 | 7 | 3 50.59 |
| 28 | 22 45.7 | 243 35.8 | 356 40.1 | 81 57.8 | 8 | 4 23.53 |
| | | | | | 9 | 4 56.47 |
| Sept. 7 | 22 45.0 | 243 3.1 | 356 41.1 | 213 43.6 | 10 | 5 29.41 |
| 17 | 22 44.2 | 242 30.4 | 356 42.1 | 345 29.4 | 11 | 6 2.35 |
| 27 | 22 43.5 | 241 57.7 | 356 43.1 | 117 15.3 | 12 | 6 35.29 |
| Oct. 7 | 22 42.8 | 241 25.0 | 356 44.1 | 249 1.1 | 13 | 7 8.23 |
| 17 | 22 42.0 | 240 52.3 | 356 45.1 | 20 46.9 | 14 | 7 41.17 |
| | | | | | 15 | 8 14.11 |
| 27 | 22 41.3 | 240 19.7 | 356 46.1 | 152 32.8 | 16 | 8 47.06 |
| Nov. 6 | 22 40.6 | 239 46.9 | 356 47.2 | 284 18.6 | 17 | 9 20.00 |
| 16 | 22 39.9 | 239 14.1 | 356 48.3 | 56 4.5 | 18 | 9 52.94 |
| 26 | 22 39.2 | 238 41.3 | 356 49.4 | 187 50.3 | 19 | 10 25.88 |
| Dec. 6 | 22 38.5 | 238 8.5 | 356 50.5 | 319 36.1 | 20 | 10 58.82 |
| | | | | | 21 | 11 31.76 |
| 16 | 22 37.8 | 237 35.8 | 356 51.6 | 91 22.0 | 22 | 12 4.70 |
| 26 | 22 37.1 | 237 2.9 | 356 52.7 | 223 7.8 | 23 | 12 37.64 |
| 36 | 22 36.4 | 236 30.0 | 356 53.8 | 354 53.6 | | |

TABLE FOR THE LIBRATION OF THE MOON.

Argument, $(\Omega - \lambda)$ or $(\Omega - \lambda - 180^\circ)$.

| $\Omega - \lambda$ | $\Delta \lambda$ | $\frac{1}{a}$ | B | | $\Omega - \lambda$ | $\Delta \lambda$ | $\frac{1}{a}$ | B | |
|--------------------|------------------|---------------|--------------------|-----|--------------------|------------------|---------------|--------------------|-----|
| 0 | 0.0 | 39 | 0 0.0 | 180 | 46 | 0.6 | 56 | 1 3.9 | 134 |
| 1 | 0.0 | 39 | 0 1.6 | 179 | 47 | 0.6 | 57 | 1 4.9 | 133 |
| 2 | 0.0 | 39 | 0 3.1 | 178 | 48 | 0.6 | 58 | 1 6.0 | 132 |
| 3 | 0.1 | 39 | 0 4.7 | 177 | 49 | 0.6 | 59 | 1 7.0 | 131 |
| 4 | 0.1 | 39 | 0 6.2 | 176 | 50 | 0.6 | 60 | 1 8.0 | 130 |
| 5 | 0.1 | 39 | 0 7.7 | 175 | 51 | 0.6 | 62 | 1 9.0 | 129 |
| 6 | 0.2 | 39 | 0 9.3 | 174 | 52 | 0.6 | 63 | 1 10.0 | 128 |
| 7 | 0.2 | 39 | 0 10.8 | 173 | 53 | 0.5 | 64 | 1 10.9 | 127 |
| 8 | 0.2 | 39 | 0 12.4 | 172 | 54 | 0.5 | 66 | 1 11.8 | 126 |
| 9 | 0.2 | 39 | 0 13.9 | 171 | 55 | 0.5 | 67 | 1 12.7 | 125 |
| 10 | 0.2 | 39 | 0 15.4 | 170 | 56 | 0.5 | 69 | 1 13.6 | 124 |
| 11 | 0.3 | 39 | 0 16.9 | 169 | 57 | 0.5 | 71 | 1 14.5 | 123 |
| 12 | 0.3 | 40 | 0 18.5 | 168 | 58 | 0.5 | 73 | 1 15.3 | 122 |
| 13 | 0.3 | 40 | 0 20.0 | 167 | 59 | 0.5 | 75 | 1 16.1 | 121 |
| 14 | 0.3 | 40 | 0 21.5 | 166 | 60 | 0.5 | 77 | 1 16.9 | 120 |
| 15 | 0.3 | 40 | 0 23.0 | 165 | 61 | 0.5 | 80 | 1 17.6 | 119 |
| 16 | 0.3 | 40 | 0 24.5 | 164 | 62 | 0.5 | 83 | 1 18.4 | 118 |
| 17 | 0.3 | 40 | 0 26.0 | 163 | 63 | 0.5 | 86 | 1 19.1 | 117 |
| 18 | 0.3 | 41 | 0 27.4 | 162 | 64 | 0.5 | 89 | 1 19.8 | 116 |
| 19 | 0.4 | 41 | 0 28.9 | 161 | 65 | 0.4 | 92 | 1 20.4 | 115 |
| 20 | 0.4 | 41 | 0 30.4 | 160 | 66 | 0.4 | 95 | 1 21.1 | 114 |
| 21 | 0.4 | 41 | 0 31.8 | 159 | 67 | 0.4 | 99 | 1 21.7 | 113 |
| 22 | 0.4 | 42 | 0 33.2 | 158 | 68 | 0.4 | 103 | 1 22.3 | 112 |
| 23 | 0.4 | 42 | 0 34.7 | 157 | 69 | 0.4 | 108 | 1 22.9 | 111 |
| 24 | 0.4 | 42 | 0 36.1 | 156 | 70 | 0.4 | 113 | 1 23.4 | 110 |
| 25 | 0.4 | 43 | 0 37.5 | 155 | 71 | 0.4 | 119 | 1 23.9 | 109 |
| 26 | 0.5 | 43 | 0 38.9 | 154 | 72 | 0.4 | 125 | 1 24.4 | 108 |
| 27 | 0.5 | 43 | 0 40.3 | 153 | 73 | 0.4 | 132 | 1 24.9 | 107 |
| 28 | 0.5 | 44 | 0 41.7 | 152 | 74 | 0.3 | 141 | 1 25.3 | 106 |
| 29 | 0.5 | 44 | 0 43.1 | 151 | 75 | 0.3 | 150 | 1 25.7 | 105 |
| 30 | 0.5 | 45 | 0 44.4 | 150 | 76 | 0.3 | 160 | 1 26.1 | 104 |
| 31 | 0.5 | 45 | 0 45.7 | 149 | 77 | 0.3 | 172 | 1 26.5 | 103 |
| 32 | 0.5 | 46 | 0 47.0 | 148 | 78 | 0.2 | 186 | 1 26.8 | 102 |
| 33 | 0.5 | 46 | 0 48.4 | 147 | 79 | 0.2 | 202 | 1 27.1 | 101 |
| 34 | 0.5 | 47 | 0 49.7 | 146 | 80 | 0.2 | 222 | 1 27.4 | 100 |
| 35 | 0.5 | 47 | 0 51.0 | 145 | 81 | 0.2 | 247 | 1 27.7 | 99 |
| 36 | 0.5 | 48 | 0 52.2 | 144 | 82 | 0.2 | 278 | 1 27.9 | 98 |
| 37 | 0.5 | 48 | 0 53.4 | 143 | 83 | 0.1 | 318 | 1 28.1 | 97 |
| 38 | 0.6 | 49 | 0 54.7 | 142 | 84 | 0.1 | 370 | 1 28.3 | 96 |
| 39 | 0.6 | 50 | 0 55.9 | 141 | 85 | 0.1 | 440 | 1 28.5 | 95 |
| 40 | 0.6 | 50 | 0 57.1 | 140 | 86 | 0.1 | 555 | 1 28.6 | 94 |
| 41 | 0.6 | 51 | 0 58.3 | 139 | 87 | 0.1 | 740 | 1 28.7 | 93 |
| 42 | 0.6 | 52 | 0 59.4 | 138 | 88 | 0.0 | 1110 | 1 28.7 | 92 |
| 43 | 0.6 | 53 | 1 0.6 | 137 | 89 | 0.0 | 2220 | 1 28.8 | 91 |
| 44 | 0.6 | 54 | 1 1.7 | 136 | 90 | 0.0 | ∞ | 1 28.8 | 90 |
| 45 | 0.6 | 55 | 1 2.8 | 135 | | | | | |
| $\Delta \lambda$ | $\frac{1}{a}$ | B | $\Omega - \lambda$ | | $\Delta \lambda$ | $\frac{1}{a}$ | B | $\Omega - \lambda$ | |

 $\Delta \lambda$ has the sign of $\tan (\lambda - \Omega)$ a has the sign of $\cos (\Omega - \lambda)$ B has the sign of $\sin (\Omega - \lambda)$

FOR GREENWICH MEAN NOON.

| Date. | Apparent Obliquity of the Ecliptic. (HANSEN.) | Equation of Equinoxes | | Precession of Equinoxes in Longitude. | The Sun's | | Mean Longitude of Moon's Ascending Node. |
|---|---|-----------------------|----------|---|-------------|-----------|--|
| | | In Longitude. | In R. A. | | Aberration. | Hor. Par. | |
| Jan. 0 | 23° 27' 14.46 | — 16.05 | — 0.982 | 0.00 | — 20.80 | 9.00 | 73° 14.4 |
| 10 | 14.63 | 15.61 | 0.955 | 1.38 | 20.79 | 9.00 | 72 42.7 |
| 20 | 14.84 | 15.29 | 0.935 | 2.75 | 20.77 | 8.99 | 72 10.9 |
| 30 | 15.09 | 15.10 | 0.923 | 4.13 | 20.74 | 8.98 | 71 39.1 |
| Feb. 9 | 15.35 | 15.05 | 0.920 | 5.50 | 20.71 | 8.96 | 71 7.3 |
| 19 | 23 27 15.59 | — 15.15 | — 0.926 | 6.88 | — 20.67 | 8.94 | 70 35.6 |
| March 1 | 15.80 | 15.37 | 0.940 | 8.26 | 20.63 | 8.92 | 70 3.8 |
| 11 | 15.96 | 15.69 | 0.960 | 9.63 | 20.57 | 8.90 | 69 32.0 |
| 21 | 16.05 | 16.05 | 0.982 | 11.01 | 20.51 | 8.87 | 69 0.3 |
| 31 | 16.08 | 16.40 | 1.003 | 12.38 | 20.45 | 8.85 | 68 28.5 |
| April 10 | 23 27 16.05 | — 16.70 | — 1.021 | 13.76 | — 20.39 | 8.82 | 67 56.7 |
| 20 | 15.98 | 16.90 | 1.034 | 15.14 | 20.34 | 8.80 | 67 24.9 |
| 30 | 15.87 | 16.98 | 1.038 | 16.51 | 20.29 | 8.78 | 66 53.2 |
| May 10 | 15.75 | 16.93 | 1.035 | 17.89 | 20.24 | 8.76 | 66 21.4 |
| 20 | 15.64 | 16.74 | 1.024 | 19.26 | 20.19 | 8.74 | 65 49.6 |
| 30 | 23 27 15.56 | — 16.41 | — 1.004 | 20.64 | — 20.16 | 8.72 | 65 17.9 |
| June 9 | 15.53 | 15.99 | 0.978 | 22.02 | 20.13 | 8.71 | 64 46.1 |
| 19 | 15.55 | 15.52 | 0.949 | 23.39 | 20.11 | 8.71 | 64 14.3 |
| 29 | 15.64 | 15.04 | 0.920 | 24.77 | 20.11 | 8.70 | 63 42.5 |
| July 9 | 15.78 | 14.60 | 0.893 | 26.11 | 20.10 | 8.70 | 63 10.8 |
| 19 | 23 27 15.96 | — 14.22 | — 0.870 | 27.52 | — 20.12 | 8.71 | 62 39.0 |
| 29 | 16.17 | 13.96 | 0.854 | 28.90 | 20.14 | 8.72 | 62 7.2 |
| Aug. 8 | 16.41 | 13.82 | 0.845 | 30.27 | 20.17 | 8.73 | 61 35.5 |
| 18 | 16.65 | 13.81 | 0.845 | 31.65 | 20.20 | 8.75 | 61 3.7 |
| 28 | 16.87 | 13.94 | 0.853 | 33.02 | 20.24 | 8.77 | 60 31.9 |
| Sept. 7 | 23 27 17.04 | — 14.18 | — 0.867 | 34.40 | — 20.29 | 8.79 | 60 0.1 |
| 17 | 17.16 | 14.48 | 0.886 | 35.78 | 20.35 | 8.81 | 59 28.4 |
| 27 | 17.23 | 14.83 | 0.907 | 37.15 | 20.41 | 8.83 | 58 56.6 |
| Oct. 7 | 17.23 | 15.15 | 0.926 | 38.53 | 20.47 | 8.86 | 58 24.8 |
| 17 | 17.17 | 15.41 | 0.942 | 39.90 | 20.53 | 8.88 | 57 53.0 |
| 27 | 23 27 17.07 | — 15.56 | — 0.951 | 41.28 | — 20.59 | 8.91 | 57 21.3 |
| Nov. 6 | 16.94 | 15.55 | 0.951 | 42.66 | 20.64 | 8.93 | 56 49.5 |
| 16 | 16.82 | 15.39 | 0.941 | 44.03 | 20.69 | 8.95 | 56 17.7 |
| 26 | 16.72 | 15.10 | 0.923 | 45.41 | 20.73 | 8.97 | 55 46.0 |
| Dec. 6 | 16.65 | 14.69 | 0.898 | 46.78 | 20.76 | 8.98 | 55 14.2 |
| 16 | 23 27 16.64 | — 14.19 | — 0.868 | 48.16 | — 20.78 | 8.99 | 54 42.4 |
| 26 | 16.69 | 13.65 | 0.835 | 49.54 | 20.79 | 9.00 | 54 10.6 |
| 36 | 23 27 16.81 | — 13.14 | — 0.804 | 50.91 | — 20.79 | 9.00 | 53 38.9 |
| Mean Obliquity, 1891.0, 23° 27' 12".23 (HANSEN). Mean Obliquity, 1891.0, 23° 27' 11".94 (PETERS). Precession for 1891 50".2617 log 1.70124 Precession in a Solar Day 0".1376 log 9.13863 Precession in a Sidereal Day 0".1372 log 9.13744 Sun's Mean Equatorial Horizontal Parallax . 8".848 log 0.94685 | | | | | | | Daily Motion of Ω — 3'.1773 |

P A R T I I

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON

**FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING
THE NOTATION OF BESSEL, AND THE CONSTANTS OF PETERS AND STRUVE.**

NOTATION.

- τ , the time, reckoned in units of one year, from the beginning of the Besselian fictitious year,
(1890, December 30^d.922 = 1891, January 0^d.0—0^d.078, Washington mean time),
 α_0, δ_0 , the star's mean right ascension and declination at the beginning of the fictitious year,
 α, δ , the star's apparent right ascension and declination at the time τ ,
 μ, μ' , the annual proper motion in right ascension and declination,
 \odot , the sun's true longitude,
 Ω , the longitude of the moon's ascending node,
 ω , the obliquity of the ecliptic,
 Γ , the longitude of the sun's perigee,
 Γ' , the longitude of the moon's perigee,
 ϱ , the moon's mean longitude

BESSELIAN STAR-NUMBERS.

$$\begin{aligned}
 A &= \tau - 0.34249 \sin \odot & - 0.00011 \sin (3 \odot - \Gamma) \\
 &+ 0.00410 \sin 2 \odot & - 0.00005 \sin 2 (\odot - \Omega) \\
 &- 0.02521 \sin 2 \odot & + 0.00010 \sin 2 (\odot - \Gamma') \\
 &+ 0.00293 \sin (\odot + 92^\circ 4') & + 0.00009 \sin (2 \Gamma' - \Omega) \\
 &+ 0.00025 \sin (2 \odot - \Omega) & + 0.00005 \cos \Gamma' \\
 &- 0.00405 \sin 2 \varrho & + 0.00004 \sin 2 \Gamma' \\
 &+ 0.00135 \sin (\varrho - \Gamma') \\
 B &= - 9''.2239 \cos \odot & - 0''.0027 \cos (3 \odot - \Gamma) \\
 &+ 0.0895 \cos 2 \odot & + 0.0067 \cos (2 \odot - \Omega) \\
 &- 0.5506 \cos 2 \odot & + 0.0024 \cos (2 \Gamma' - \Omega) \\
 &- 0.0092 \cos (\odot + 281^\circ 3') & - 0.0023 \sin \Gamma' \\
 &- 0.0986 \cos 2 \varrho & + 0.0008 \cos 2 \Gamma' \\
 C &= - 20''.4451 \cos \omega \cos \odot \\
 D &= - 20''.4451 \sin \odot \\
 E &= - 0.0461 \sin \odot + 0''.0014 \sin 2 \odot - 0''.0033 \sin 2 \odot
 \end{aligned}$$

BESSEL'S Star-Constants.

$$\begin{aligned}
 a &= 3''.07255 + 1''.33687 \sin \alpha_0 \tan \delta_0 = \text{precession in right ascension} \\
 b &= \frac{1}{15} \cos \alpha_0 \tan \delta_0 \\
 c &= \frac{1}{15} \cos \alpha_0 \sec \delta_0 \\
 d &= \frac{1}{15} \sin \alpha_0 \sec \delta_0 \\
 a' &= 20''.0529 \cos \alpha_0 = \text{precession in declination} \\
 b' &= - \sin \alpha_0 \\
 c' &= \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0 \\
 d' &= \cos \alpha_0 \sin \delta_0
 \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned}
 \alpha &= \alpha_0 + \tau \mu + Aa + Bb + Cc + Dd + \frac{1}{15} E & (\text{in time}) \\
 \delta &= \delta_0 + \tau \mu' + Aa' + Bb' + Cc' + Dd' & (\text{in arc})
 \end{aligned}$$

INDEPENDENT STAR-NUMBERS.

$$\begin{aligned}
 f &= 46''.0832 A + E \text{ (in arc)} = 3''.07255 A + \frac{1}{15} E \text{ (in time)} \\
 g \sin G &= B & h \sin H &= C \\
 g \cos G &= 20''.0529 A & h \cos H &= D & i &= C \tan \omega
 \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned}
 \alpha &= \alpha_0 + f + \tau \mu + \frac{1}{15} g \sin (G + \alpha_0) \tan \delta_0 + \frac{1}{15} h \sin (H + \alpha_0) \sec \delta_0 & (\text{in time}) \\
 \delta &= \delta_0 + \tau \mu' + g \cos (G + \alpha_0) + h \cos (H + \alpha_0) \sin \delta_0 + i \cos \delta_0 & (\text{in arc})
 \end{aligned}$$

NOTES.—(1) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when BESSEL's star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(2) In using the star-constants of the *British Association Catalogue*, $a, b, c, d, a', b', c', d'$, must be changed to $c, d, a, b, -c', -d', -a', -b'$, respectively.

FOR WASHINGTON MEAN MIDNIGHT.

| Solar Day. (Std. Hour.) | Log A. | Log B. | Log C. | Log D. | Solar Day. (Std. Hour.) | Log A. | Log B. | Log C. | Log D. |
|----------------------------|---------|---------|---------|---------|----------------------------|---------|---------|---------|---------|
| Jan. 0 | -9.4966 | -0.3616 | -0.5362 | +1.3032 | Feb. 15 | -9.2321 | -0.5188 | -1.1981 | +1.0434 |
| 1 | 9.4944 | 0.3656 | 0.5757 | 1.3017 | 16 | 9.2230 | 0.5178 | 1.2029 | 1.0313 |
| 2 | 9.4920 | 0.3664 | 0.6119 | 1.3000 | 17 | 9.2126 | 0.5184 | 1.2075 | 1.0187 |
| 3 | 9.4889 | 0.3643 | 0.6451 | 1.2982 | 18 | 9.2014 | 0.5213 | 1.2120 | 1.0055 |
| 4 | 9.4847 | 0.3604 | 0.6757 | 1.2963 | 19 | 9.1904 | 0.5266 | 1.2163 | 0.9918 |
| h (7.0) 5 | -9.4793 | -0.3562 | -0.7043 | +1.2942 | h (10.0) 20 | -9.1809 | -0.5336 | -1.2204 | +0.9774 |
| 6 | 9.4725 | 0.3533 | 0.7310 | 1.2921 | 21 | 9.1735 | 0.5415 | 1.2243 | 0.9624 |
| 7 | 9.4647 | 0.3530 | 0.7559 | 1.2899 | 22 | 9.1686 | 0.5493 | 1.2280 | 0.9468 |
| 8 | 9.4563 | 0.3562 | 0.7794 | 1.2874 | 23 | 9.1661 | 0.5560 | 1.2316 | 0.9306 |
| 9 | 9.4479 | 0.3629 | 0.8016 | 1.2846 | 24 | 9.1652 | 0.5607 | 1.2350 | 0.9138 |
| 10 | -9.4399 | -0.3725 | -0.8225 | +1.2815 | 25 | -9.1651 | -0.5633 | -1.2383 | +0.8960 |
| 11 | 9.4332 | 0.3834 | 0.8425 | 1.2783 | 26 | 9.1638 | 0.5636 | 1.2414 | 0.8772 |
| 12 | 9.4275 | 0.3943 | 0.8615 | 1.2750 | 27 | 9.1609 | 0.5623 | 1.2443 | 0.8574 |
| 13 | 9.4232 | 0.4037 | 0.8795 | 1.2716 | 28 | 9.1556 | 0.5600 | 1.2471 | 0.8367 |
| 14 | 9.4196 | 0.4106 | 0.8965 | 1.2682 | Mar. 1 | 9.1473 | 0.5578 | 1.2497 | 0.8150 |
| 15 | -9.4164 | -0.4145 | -0.9126 | +1.2648 | 2 | -9.1364 | -0.5565 | -1.2521 | +0.7918 |
| 16 | 9.4132 | 0.4155 | 0.9281 | 1.2612 | 3 | 9.1235 | 0.5570 | 1.2544 | 0.7671 |
| 17 | 9.4091 | 0.4142 | 0.9430 | 1.2573 | 4 | 9.1101 | 0.5597 | 1.2566 | 0.7408 |
| 18 | 9.4037 | 0.4116 | 0.9573 | 1.2531 | 5 | 9.0969 | 0.5643 | 1.2587 | 0.7127 |
| 19 | 9.3970 | 0.4092 | 0.9710 | 1.2486 | 6 | 9.0854 | 0.5703 | 1.2607 | 0.6826 |
| h (8.0) 20 | -9.3890 | -0.4084 | -0.9842 | +1.2439 | h (11.0) 7 | -9.0763 | -0.5769 | -1.2626 | +0.6501 |
| 21 | 9.3802 | 0.4102 | 0.9969 | 1.2390 | 8 | 9.0701 | 0.5831 | 1.2643 | 0.6148 |
| 22 | 9.3711 | 0.4151 | 1.0091 | 1.2340 | 9 | 9.0665 | 0.5879 | 1.2658 | 0.5763 |
| 23 | 9.3626 | 0.4228 | 1.0208 | 1.2289 | 10 | 9.0644 | 0.5908 | 1.2671 | 0.5339 |
| 24 | 9.3551 | 0.4326 | 1.0319 | 1.2237 | 11 | 9.0622 | 0.5917 | 1.2682 | 0.4868 |
| 25 | -9.3491 | -0.4432 | -1.0425 | +1.2184 | 12 | -9.0593 | -0.5905 | -1.2692 | +0.4338 |
| 26 | 9.3448 | 0.4532 | 1.0528 | 1.2127 | 13 | 9.0542 | 0.5880 | 1.2701 | 0.3731 |
| 27 | 9.3419 | 0.4615 | 1.0628 | 1.2068 | 14 | 9.0462 | 0.5848 | 1.2709 | 0.3030 |
| 28 | 9.3398 | 0.4673 | 1.0725 | 1.2007 | 15 | 9.0349 | 0.5819 | 1.2716 | 0.2190 |
| 29 | 9.3379 | 0.4704 | 1.0819 | 1.1943 | 16 | 9.0210 | 0.5803 | 1.2723 | 0.1145 |
| 30 | -9.3352 | -0.4710 | -1.0909 | +1.1877 | 17 | -9.0054 | -0.5804 | -1.2728 | +9.9763 |
| 31 | 9.3313 | 0.4698 | 1.0996 | 1.1808 | 18 | 8.9894 | 0.5826 | 1.2731 | 9.7718 |
| Feb. 1 | 9.3255 | 0.4679 | 1.1080 | 1.1737 | 19 | 8.9750 | 0.5866 | 1.2732 | +9.3775 |
| 2 | 9.3179 | 0.4665 | 1.1161 | 1.1664 | 20 | 8.9636 | 0.5916 | 1.2732 | -9.0613 |
| 3 | 9.3087 | 0.4668 | 1.1230 | 1.1589 | 21 | 8.9559 | 0.5969 | 1.2730 | 9.6715 |
| h (9.0) 4 | -9.2984 | -0.4696 | -1.1313 | +1.1511 | h (12.0) 22 | -8.9521 | -0.6015 | -1.2727 | -9.9155 |
| 5 | 9.2878 | 0.4750 | 1.1385 | 1.1430 | 23 | 8.9513 | 0.6046 | 1.2723 | 0.0704 |
| 6 | 9.2777 | 0.4827 | 1.1455 | 1.1346 | 24 | 8.9519 | 0.6058 | 1.2718 | 0.1843 |
| 7 | 9.2690 | 0.4918 | 1.1522 | 1.1259 | 25 | 8.9520 | 0.6049 | 1.2712 | 0.2743 |
| 8 | 9.2620 | 0.5011 | 1.1587 | 1.1168 | 26 | 8.9496 | 0.6023 | 1.2705 | 0.3487 |
| 9 | -9.2570 | -0.5095 | -1.1650 | +1.1074 | 27 | -8.9435 | -0.5985 | -1.2697 | -0.4120 |
| 10 | 9.2534 | 0.5162 | 1.1711 | 1.0975 | 28 | 8.9328 | 0.5945 | 1.2687 | 0.4671 |
| 11 | 9.2508 | 0.5205 | 1.1769 | 1.0873 | 29 | 8.9172 | 0.5910 | 1.2676 | 0.5158 |
| 12 | 9.2481 | 0.5224 | 1.1825 | 1.0768 | 30 | 8.8973 | 0.5889 | 1.2662 | 0.5595 |
| 13 | 9.2445 | 0.5222 | 1.1879 | 1.0660 | 31 | 8.8748 | 0.5888 | 1.2647 | 0.5991 |
| 14 | -9.2393 | -0.5207 | -1.1931 | +1.0550 | Apr. 1 | -8.8512 | -0.5906 | -1.2631 | -0.6352 |
| 15 | -9.2321 | -0.5188 | -1.1981 | +1.0434 | 2 | -8.8292 | -0.5940 | -1.2614 | -0.6684 |

FOR WASHINGTON MEAN MIDNIGHT.

| Solar Day. (Sid. Hour.) | Log A. | Log B. | Log C. | Log D. | Solar Day. (Sid. Hour.) | Log A. | Log B. | Log C. | Log D. |
|----------------------------|---------|---------|---------|---------|----------------------------|---------|---------|---------|---------|
| Apr. 1 | -8.8512 | -0.5906 | -1.2631 | -0.6352 | May 17 | +8.6667 | -0.5670 | -1.0098 | -1.2340 |
| 2 | 8.8292 | 0.5940 | 1.2614 | 0.6684 | 18 | 8.6763 | 0.5658 | 0.9984 | 1.2387 |
| 3 | 8.8108 | 0.5982 | 1.2596 | 0.6990 | 19 | 8.6881 | 0.5626 | 0.9865 | 1.2432 |
| 4 | 8.7976 | 0.6024 | 1.2577 | 0.7276 | 20 | 8.7055 | 0.5576 | 0.9742 | 1.2474 |
| 5 | 8.7883 | 0.6056 | 1.2557 | 0.7543 | 21 | 8.7287 | 0.5518 | 0.9613 | 1.2515 |
| h 6 | -8.7820 | -0.6072 | -1.2536 | -0.7792 | h 22 | +8.7579 | -0.5460 | -0.9479 | -1.2555 |
| (13.0) 7 | 8.7787 | 0.6068 | 1.2513 | 0.8027 | (16.0) 23 | 8.7910 | 0.5415 | 0.9340 | 1.2593 |
| 8 | 8.7729 | 0.6044 | 1.2488 | 0.8248 | 24 | 8.8254 | 0.5388 | 0.9196 | 1.2630 |
| 9 | 8.7633 | 0.6005 | 1.2461 | 0.8458 | 25 | 8.8522 | 0.5385 | 0.9048 | 1.2666 |
| 10 | 8.7479 | 0.5956 | 1.2432 | 0.8656 | 26 | 8.8879 | 0.5405 | 0.8892 | 1.2700 |
| 11 | -8.7253 | -0.5908 | -1.2402 | -0.8844 | 27 | +8.9130 | -0.5440 | -0.8728 | -1.2733 |
| 12 | 8.6956 | 0.5869 | 1.2371 | 0.9023 | 28 | 8.9329 | 0.5483 | 0.8556 | 1.2764 |
| 13 | 8.6598 | 0.5846 | 1.2339 | 0.9194 | 29 | 8.9476 | 0.5523 | 0.8376 | 1.2793 |
| 14 | 8.6199 | 0.5843 | 1.2305 | 0.9358 | 30 | 8.9596 | 0.5550 | 0.8187 | 1.2820 |
| 15 | 8.5794 | 0.5859 | 1.2270 | 0.9514 | 31 | 8.9691 | 0.5558 | 0.7987 | 1.2846 |
| 16 | -8.5429 | -0.5890 | -1.2234 | -0.9664 | June 1 | +8.9782 | -0.5545 | -0.7776 | -1.2871 |
| 17 | 8.5139 | 0.5926 | 1.2193 | 0.9807 | 2 | 8.9886 | 0.5511 | 0.7554 | 1.2895 |
| 18 | 8.4945 | 0.5959 | 1.2156 | 0.9944 | 3 | 9.0010 | 0.5464 | 0.7321 | 1.2918 |
| 19 | 8.4842 | 0.5981 | 1.2114 | 1.0075 | 4 | 9.0167 | 0.5410 | 0.7074 | 1.2939 |
| 20 | 8.4795 | 0.5984 | 1.2070 | 1.0200 | 5 | 9.0352 | 0.5362 | 0.6808 | 1.2959 |
| h 21 | -8.4742 | -0.5967 | -1.2024 | -1.0321 | h 6 | +9.0550 | -0.5329 | -0.6524 | -1.2977 |
| (14.0) 22 | 8.4627 | 0.5930 | 1.1977 | 1.0438 | (17.0) 7 | 9.0750 | 0.5319 | 0.6219 | 1.2994 |
| 23 | 8.4406 | 0.5880 | 1.1929 | 1.0551 | 8 | 9.0937 | 0.5332 | 0.5890 | 1.3010 |
| 24 | 8.4016 | 0.5824 | 1.1880 | 1.0660 | 9 | 9.1103 | 0.5366 | 0.5534 | 1.3025 |
| 25 | 8.3408 | 0.5771 | 1.1829 | 1.0764 | 10 | 9.1239 | 0.5415 | 0.5143 | 1.3038 |
| 26 | -8.2521 | -0.5730 | -1.1776 | -1.0864 | 11 | +9.1343 | -0.5467 | -0.4713 | -1.3050 |
| 27 | 8.1277 | 0.5709 | 1.1720 | 1.0961 | 12 | 9.1419 | 0.5512 | 0.4234 | 1.3061 |
| 28 | 7.9474 | 0.5709 | 1.1662 | 1.1055 | 13 | 9.1474 | 0.5542 | 0.3693 | 1.3071 |
| 29 | 7.6599 | 0.5727 | 1.1602 | 1.1146 | 14 | 9.1520 | 0.5552 | 0.3076 | 1.3080 |
| 30 | -6.9731 | 0.5758 | 1.1540 | 1.1234 | 15 | 9.1570 | 0.5540 | 0.2354 | 1.3087 |
| May 1 | +7.2923 | -0.5792 | -1.1476 | -1.1319 | 16 | +9.1635 | -0.5511 | -0.1486 | -1.3093 |
| 2 | 7.6117 | 0.5820 | 1.1410 | 1.1401 | 17 | 9.1722 | 0.5470 | 0.0397 | 1.3098 |
| 3 | 7.7497 | 0.5833 | 1.1342 | 1.1480 | 18 | 9.1830 | 0.5427 | 9.8942 | 1.3102 |
| 4 | 7.8395 | 0.5827 | 1.1271 | 1.1556 | 19 | 9.1960 | 0.5393 | 9.6734 | 1.3105 |
| 5 | 7.9170 | 0.5799 | 1.1198 | 1.1629 | 20 | 9.2104 | 0.5378 | -9.2004 | 1.3106 |
| h 6 | +8.0021 | -0.5754 | -1.1123 | -1.1699 | h 21 | +9.2250 | -0.5385 | +9.1820 | -1.3106 |
| (15.0) 7 | 8.0983 | 0.5697 | 1.1045 | 1.1767 | (18.0) 22 | 9.2390 | 0.5416 | 9.6672 | 1.3105 |
| 8 | 8.2001 | 0.5637 | 1.0964 | 1.1833 | 23 | 9.2515 | 0.5465 | 9.8904 | 1.3102 |
| 9 | 8.2987 | 0.5585 | 1.0880 | 1.1898 | 24 | 9.2619 | 0.5524 | 0.0369 | 1.3098 |
| 10 | 8.3886 | 0.5548 | 1.0793 | 1.1961 | 25 | 9.2702 | 0.5584 | 0.1461 | 1.3093 |
| 11 | +8.4657 | -0.5533 | -1.0703 | -1.2021 | 26 | +9.2767 | -0.5634 | +0.2332 | -1.3087 |
| 12 | 8.5289 | 0.5540 | 1.0610 | 1.2079 | 27 | 9.2821 | 0.5667 | 0.3057 | 1.3080 |
| 13 | 8.5781 | 0.5585 | 1.0514 | 1.2135 | 28 | 9.2866 | 0.5678 | 0.3676 | 1.3072 |
| 14 | 8.6140 | 0.5600 | 1.0415 | 1.2189 | 29 | 9.2917 | 0.5671 | 0.4218 | 1.3062 |
| 15 | 8.6390 | 0.5635 | 1.0314 | 1.2241 | 30 | 9.2979 | 0.5648 | 0.4697 | 1.3051 |
| 16 | +8.6554 | -0.5661 | -1.0208 | -1.2291 | July 1 | +9.3055 | -0.5616 | +0.5128 | -1.3039 |
| 17 | +8.6667 | -0.5670 | -1.0098 | -1.2340 | 2 | +9.3146 | -0.5587 | +0.5519 | -1.3026 |

FOR WASHINGTON MEAN MIDNIGHT.

| Solar Day. (Sid. Hour.) | Log A. | Log B. | Log C. | Log D. | Solar Day. (Sid. Hour.) | Log A. | Log B. | Log C. | Log D. |
|----------------------------|---------|---------|---------|---------|----------------------------|---------|---------|---------|---------|
| July 1 | +9.3055 | -0.5616 | +0.5128 | -1.3039 | Aug. 16 | +9.5476 | -0.6640 | +1.1813 | -1.0797 |
| 2 | 9.3146 | 0.5587 | 0.5519 | 1.3026 | 17 | 9.5522 | 0.6696 | 1.1864 | 1.0695 |
| 3 | 9.3250 | 0.5569 | 0.5577 | 1.3012 | 18 | 9.5558 | 0.6756 | 1.1913 | 1.0591 |
| 4 | 9.3358 | 0.5571 | 0.6206 | 1.2996 | 19 | 9.5583 | 0.6813 | 1.1961 | 1.0483 |
| 5 | 9.3461 | 0.5595 | 0.6511 | 1.2979 | 20 | 9.5601 | 0.6859 | 1.2008 | 1.0370 |
| h 6 | +9.3559 | -0.5640 | +0.6794 | -1.2960 | h 21 | +9.5613 | -0.6888 | +1.2053 | -1.0252 |
| (19.0) 7 | 9.3642 | 0.5701 | 0.7060 | 1.2940 | (22.0) 22 | 9.5624 | 0.6901 | 1.2097 | 1.0128 |
| 8 | 9.3705 | 0.5767 | 0.7309 | 1.2919 | 23 | 9.5639 | 0.6900 | 1.2140 | 0.9999 |
| 9 | 9.3752 | 0.5830 | 0.7543 | 1.2897 | 24 | 9.5660 | 0.6888 | 1.2181 | 0.9864 |
| 10 | 9.3786 | 0.5881 | 0.7765 | 1.2874 | 25 | 9.5690 | 0.6872 | 1.2220 | 0.9723 |
| 11 | +9.3811 | -0.5914 | +0.7974 | -1.2849 | 26 | +9.5730 | -0.6860 | +1.2257 | -0.9576 |
| 12 | 9.3836 | 0.5927 | 0.8173 | 1.2823 | 27 | 9.5775 | 0.6857 | 1.2292 | 0.9423 |
| 13 | 9.3867 | 0.5921 | 0.8361 | 1.2795 | 28 | 9.5822 | 0.6870 | 1.2324 | 0.9262 |
| 14 | 9.3910 | 0.5903 | 0.8540 | 1.2766 | 29 | 9.5867 | 0.6898 | 1.2355 | 0.9099 |
| 15 | 9.3967 | 0.5880 | 0.8711 | 1.2736 | 30 | 9.5906 | 0.6941 | 1.2385 | 0.8932 |
| 16 | +9.4038 | -0.5863 | +0.8875 | -1.2704 | 31 | +9.5937 | -0.6991 | +1.2415 | -0.8752 |
| 17 | 9.4119 | 0.5859 | 0.9032 | 1.2670 | Sept. 1 | 9.5957 | 0.7043 | 1.2444 | 0.8562 |
| 18 | 9.4207 | 0.5876 | 0.9183 | 1.2635 | 2 | 9.5968 | 0.7089 | 1.2472 | 0.8362 |
| 19 | 9.4291 | 0.5913 | 0.9327 | 1.2598 | 3 | 9.5971 | 0.7123 | 1.2498 | 0.8150 |
| 20 | 9.4369 | 0.5968 | 0.9465 | 1.2560 | 4 | 9.5973 | 0.7142 | 1.2522 | 0.7926 |
| 21 | +9.4437 | -0.6034 | +0.9598 | -1.2521 | h 5 | +9.5975 | -0.7144 | +1.2545 | -0.7687 |
| h 22 | 9.4488 | 0.6102 | 0.9726 | 1.2480 | (23.0) 6 | 9.5981 | 0.7134 | 1.2566 | 0.7434 |
| (20.0) 23 | 9.4528 | 0.6163 | 0.9849 | 1.2437 | 7 | 9.5996 | 0.7115 | 1.2586 | 0.7164 |
| 24 | 9.4557 | 0.6211 | 0.9967 | 1.2393 | 8 | 9.6021 | 0.7095 | 1.2604 | 0.6874 |
| 25 | 9.4583 | 0.6240 | 1.0081 | 1.2347 | 9 | 9.6054 | 0.7080 | 1.2621 | 0.6562 |
| 26 | +9.4609 | -0.6250 | +1.0191 | -1.2299 | 10 | +9.6094 | -0.7077 | +1.2637 | -0.6224 |
| 27 | 9.4640 | 0.6245 | 1.0297 | 1.2249 | 11 | 9.6134 | 0.7088 | 1.2652 | 0.5855 |
| 28 | 9.4682 | 0.6231 | 1.0309 | 1.2198 | 12 | 9.6176 | 0.7114 | 1.2666 | 0.5451 |
| 29 | 9.4735 | 0.6216 | 1.0498 | 1.2145 | 13 | 9.6211 | 0.7151 | 1.2678 | 0.5005 |
| 30 | 9.4796 | 0.6207 | 1.0594 | 1.2090 | 14 | 9.6238 | 0.7194 | 1.2689 | 0.4504 |
| 31 | +9.4863 | -0.6214 | +1.0687 | -1.2033 | 15 | +9.6258 | -0.7236 | +1.2699 | -0.3937 |
| Aug. 1 | 9.4931 | 0.6239 | 1.0777 | 1.1974 | 16 | 9.6270 | 0.7271 | 1.2708 | 0.3283 |
| 2 | 9.4994 | 0.6282 | 1.0864 | 1.1913 | 17 | 9.6277 | 0.7293 | 1.2715 | 0.2510 |
| 3 | 9.5049 | 0.6340 | 1.0948 | 1.1849 | 18 | 9.6282 | 0.7299 | 1.2721 | 0.1568 |
| 4 | 9.5091 | 0.6405 | 1.1029 | 1.1783 | 19 | 9.6289 | 0.7291 | 1.2725 | 0.0360 |
| 5 | +9.5121 | -0.6468 | +1.1107 | -1.1715 | h 20 | +9.6302 | -0.7271 | +1.2728 | -0.8678 |
| h 6 | 9.5139 | 0.6523 | 1.1182 | 1.1645 | (0.0) 21 | 9.6322 | 0.7245 | 1.2730 | 0.9510 |
| (21.0) 7 | 9.5149 | 0.6561 | 1.1254 | 1.1573 | 22 | 9.6350 | 0.7219 | 1.2731 | -8.6075 |
| 8 | 9.5159 | 0.6587 | 1.1322 | 1.1500 | 23 | 9.6385 | 0.7201 | 1.2730 | +9.4894 |
| 9 | 9.5172 | 0.6593 | 1.1388 | 1.1423 | 24 | 9.6423 | 0.7195 | 1.2728 | 9.8187 |
| 10 | +9.5191 | -0.6585 | +1.1453 | -1.1343 | 25 | +9.6461 | -0.7203 | +1.2725 | +0.0038 |
| 11 | 9.5220 | 0.6571 | 1.1517 | 1.1260 | 26 | 9.6494 | 0.7227 | 1.2721 | 0.1330 |
| 12 | 9.5262 | 0.6559 | 1.1580 | 1.1174 | 27 | 9.6522 | 0.7259 | 1.2716 | 0.2323 |
| 13 | 9.5312 | 0.6556 | 1.1642 | 1.1085 | 28 | 9.6541 | 0.7294 | 1.2710 | 0.3132 |
| 14 | 9.5368 | 0.6568 | 1.1702 | 1.0992 | 29 | 9.6551 | 0.7327 | 1.2702 | 0.3812 |
| 15 | +9.5425 | -0.6536 | +1.1759 | -1.0896 | 30 | +9.6555 | -0.7350 | +1.2692 | +0.4398 |
| 16 | +9.5476 | -0.6640 | +1.1813 | -1.0797 | Oct. 1 | +9.6555 | -0.7359 | +1.2681 | +0.4916 |

FOR WASHINGTON MEAN MIDNIGHT.

| Solar Day. (Sid. Hour.) | Log A. | Log B. | Log C. | Log D. | Solar Day. (Sid. Hour.) | Log A. | Log B. | Log C. | Log D. |
|----------------------------|---------|---------|---------|---------|----------------------------|---------|---------|---------|---------|
| Oct. 1 | +9.6555 | -0.7359 | +1.2681 | +0.4916 | Nov. 16 | +9.7551 | -0.6910 | +1.0360 | +1.2218 |
| 2 | 9.6554 | 0.7353 | 1.2668 | 0.5376 | 17 | 9.7589 | 0.6879 | 1.0251 | 1.2271 |
| 3 | 9.6558 | 0.7334 | 1.2654 | 0.5792 | 18 | 9.7628 | 0.6864 | 1.0137 | 1.2322 |
| 4 | 9.6568 | 0.7304 | 1.2639 | 0.6170 | 19 | 9.7665 | 0.6864 | 1.0018 | 1.2371 |
| 5 | 9.6587 | 0.7271 | 1.2623 | 0.6517 | 20 | 9.7699 | 0.6879 | 0.9904 | 1.2419 |
| ^h 6 | +9.6614 | -0.7240 | +1.2606 | +0.6837 | ^h (4.0) 21 | +9.7727 | -0.6904 | +0.9766 | +1.2466 |
| (1.0) 7 | 9.6647 | 0.7219 | 1.2587 | 0.7134 | 22 | 9.7749 | 0.6931 | 0.9633 | 1.2511 |
| 8 | 9.6684 | 0.7211 | 1.2567 | 0.7411 | 23 | 9.7766 | 0.6952 | 0.9493 | 1.2554 |
| 9 | 9.6721 | 0.7218 | 1.2545 | 0.7671 | 24 | 9.7777 | 0.6963 | 0.9347 | 1.2594 |
| 10 | 9.6755 | 0.7237 | 1.2522 | 0.7915 | 25 | 9.7787 | 0.6958 | 0.9195 | 1.2632 |
| 11 | +9.6782 | -0.7264 | +1.2498 | +0.8144 | 26 | +9.7797 | -0.6938 | +0.9037 | +1.2668 |
| 12 | 9.6803 | 0.7293 | 1.2472 | 0.8360 | 27 | 9.7811 | 0.6905 | 0.8873 | 1.2703 |
| 13 | 9.6817 | 0.7317 | 1.2444 | 0.8566 | 28 | 9.7832 | 0.6863 | 0.8699 | 1.2736 |
| 14 | 9.6826 | 0.7329 | 1.2415 | 0.8762 | 29 | 9.7858 | 0.6821 | 0.8515 | 1.2768 |
| 15 | 9.6833 | 0.7327 | 1.2385 | 0.8948 | 30 | 9.7892 | 0.6786 | 0.8321 | 1.2799 |
| 16 | +9.6842 | -0.7310 | +1.2353 | +0.9124 | Dec. 1 | +9.7927 | -0.6764 | +0.8117 | +1.2829 |
| 17 | 9.6853 | 0.7280 | 1.2320 | 0.9292 | 2 | 9.7965 | 0.6758 | 0.7902 | 1.2857 |
| 18 | 9.6872 | 0.7243 | 1.2285 | 0.9452 | 3 | 9.8003 | 0.6769 | 0.7674 | 1.2883 |
| 19 | 9.6898 | 0.7205 | 1.2248 | 0.9606 | 4 | 9.8036 | 0.6794 | 0.7433 | 1.2907 |
| 20 | 9.6930 | 0.7171 | 1.2209 | 0.9754 | 5 | 9.8065 | 0.6827 | 0.7176 | 1.2930 |
| ^h 21 | +9.6967 | -0.7146 | +1.2169 | +0.9897 | ^h (5.0) 6 | +9.8089 | -0.6859 | +0.6901 | +1.2952 |
| (2.0) 22 | 9.7005 | 0.7137 | 1.2127 | 1.0034 | 7 | 9.8107 | 0.6884 | 0.6607 | 1.2972 |
| 23 | 9.7040 | 0.7144 | 1.2083 | 1.0165 | 8 | 9.8123 | 0.6896 | 0.6287 | 1.2991 |
| 24 | 9.7070 | 0.7162 | 1.2037 | 1.0291 | 9 | 9.8138 | 0.6892 | 0.5943 | 1.3008 |
| 25 | 9.7094 | 0.7186 | 1.1990 | 1.0412 | 10 | 9.8155 | 0.6873 | 0.5567 | 1.3024 |
| 26 | +9.7110 | -0.7210 | +1.1941 | +1.0528 | 11 | +9.8175 | -0.6843 | +0.5154 | +1.3038 |
| 27 | 9.7119 | 0.7226 | 1.1890 | 1.0640 | 12 | 9.8201 | 0.6807 | 0.4695 | 1.3051 |
| 28 | 9.7124 | 0.7230 | 1.1837 | 1.0748 | 13 | 9.8231 | 0.6772 | 0.4181 | 1.3062 |
| 29 | 9.7129 | 0.7218 | 1.1782 | 1.0852 | 14 | 9.8265 | 0.6749 | 0.3595 | 1.3072 |
| 30 | 9.7136 | 0.7192 | 1.1725 | 1.0953 | 15 | 9.8302 | 0.6740 | 0.2916 | 1.3081 |
| 31 | +9.7147 | -0.7155 | +1.1666 | +1.1050 | 16 | +9.8339 | -0.6748 | +0.2110 | +1.3089 |
| Nov. 1 | 9.7166 | 0.7111 | 1.1604 | 1.1143 | 17 | 9.8372 | 0.6772 | 0.1116 | 1.3095 |
| 2 | 9.7192 | 0.7068 | 1.1540 | 1.1233 | 18 | 9.8402 | 0.6808 | 0.9824 | 1.3100 |
| 3 | 9.7225 | 0.7033 | 1.1474 | 1.1320 | 19 | 9.8425 | 0.6850 | 0.7973 | 1.3104 |
| 4 | 9.7263 | 0.7012 | 1.1405 | 1.1404 | 20 | 9.8443 | 0.6888 | +9.4700 | 1.3106 |
| ^h 5 | +9.7302 | -0.7006 | +1.1334 | +1.1486 | ^h (6.0) 21 | +9.8457 | -0.6917 | -8.5977 | +1.3106 |
| (3.0) 6 | 9.7338 | 0.7015 | 1.1261 | 1.1565 | 22 | 9.8467 | 0.6931 | 9.5717 | 1.3105 |
| 7 | 9.7370 | 0.7034 | 1.1185 | 1.1641 | 23 | 9.8478 | 0.6930 | 9.8490 | 1.3103 |
| 8 | 9.7396 | 0.7058 | 1.1106 | 1.1714 | 24 | 9.8492 | 0.6915 | 0.0169 | 1.3099 |
| 9 | 9.7416 | 0.7079 | 1.1024 | 1.1785 | 25 | 9.8509 | 0.6891 | 0.1376 | 1.3094 |
| 10 | +9.7430 | -0.7091 | +1.0939 | +1.1854 | 26 | +9.8531 | -0.6864 | -0.2317 | +1.3088 |
| 11 | 9.7413 | 0.7089 | 1.0851 | 1.1920 | 27 | 9.8559 | 0.6842 | 0.3090 | 1.3080 |
| 12 | 9.7456 | 0.7071 | 1.0760 | 1.1984 | 28 | 9.8590 | 0.6832 | 0.3745 | 1.3071 |
| 13 | 9.7471 | 0.7039 | 1.0666 | 1.2046 | 29 | 9.8624 | 0.6836 | 0.4313 | 1.3061 |
| 14 | 9.7492 | 0.6997 | 1.0568 | 1.2106 | 30 | 9.8657 | 0.6858 | 0.4813 | 1.3049 |
| 15 | +9.7519 | -0.6952 | +1.0466 | +1.2163 | 31 | +9.8688 | -0.6895 | -0.5261 | +1.3035 |
| 16 | +9.7531 | -0.6910 | +1.0360 | +1.2218 | 32 | +9.8715 | -0.6941 | -0.5665 | +1.3020 |

FOR WASHINGTON MEAN MIDNIGHT.

| Solar Day. (Sid. Hour.) | τ | f | | G | | H | | Log g . | Log h . | i | Log i . | | |
|----------------------------|---------------|---------|----------|---------|----------|---------|----------|-----------|-----------|---------|-----------|---------|---------|
| | | In Arc. | In Time. | In Arc. | In Time. | In Arc. | In Time. | | | | | | |
| Jan. | 0 | 0.0016 | -14.50 | -0.967 | 200 4 | 13 20.3 | 350 18 | 23 21.2 | +0.8260 | +1.3094 | -1.49 | -0.1732 | |
| | 1 | 0.0043 | 14.43 | 0.962 | 200 20 | 13 21.3 | 349 22 | 23 17.5 | 0.8245 | 1.3092 | 1.61 | 0.2128 | |
| | 2 | 0.0071 | 14.35 | 0.957 | 200 29 | 13 21.9 | 348 26 | 23 13.7 | 0.8226 | 1.3090 | 1.78 | 0.2491 | |
| | 3 | 0.0098 | 14.25 | 0.950 | 200 31 | 13 22.1 | 347 29 | 23 9.9 | 0.8196 | 1.3087 | 1.92 | 0.2822 | |
| | 4 | 0.0126 | 14.11 | 0.941 | 200 32 | 13 22.1 | 346 32 | 23 6.1 | 0.8154 | 1.3084 | 2.06 | 0.3129 | |
| | h (7.0) | 5 | 0.0153 | -13.94 | -0.929 | 200 35 | 13 22.3 | 345 35 | 23 2.3 | +0.8101 | +1.3081 | -2.20 | -0.3416 |
| | 6 | 0.0180 | 13.72 | 0.915 | 200 45 | 13 23.0 | 344 38 | 22 58.5 | 0.8038 | 1.3078 | 2.34 | 0.3682 | |
| | 7 | 0.0208 | 13.48 | 0.899 | 201 5 | 13 24.3 | 343 41 | 22 54.7 | 0.7970 | 1.3074 | 2.48 | 0.3933 | |
| | 8 | 0.0235 | 13.22 | 0.881 | 201 36 | 13 26.4 | 342 44 | 22 50.9 | 0.7901 | 1.3070 | 2.62 | 0.4167 | |
| | 9 | 0.0263 | 12.97 | 0.865 | 202 18 | 13 29.2 | 341 47 | 22 47.1 | 0.7839 | 1.3066 | 2.75 | 0.4389 | |
| | 10 | 0.0290 | -12.73 | -0.849 | 203 7 | 13 32.5 | 340 50 | 22 43.3 | +0.7785 | +1.3062 | -2.88 | -0.4599 | |
| | 11 | 0.0317 | 12.53 | 0.835 | 203 58 | 13 35.9 | 339 53 | 22 39.5 | 0.7746 | 1.3058 | 3.02 | 0.4799 | |
| | 12 | 0.0345 | 12.37 | 0.825 | 204 48 | 13 39.2 | 338 56 | 22 35.7 | 0.7717 | 1.3054 | 3.16 | 0.4929 | |
| | 13 | 0.0372 | 12.25 | 0.817 | 205 29 | 13 41.9 | 337 58 | 22 31.9 | 0.7699 | 1.3049 | 3.29 | 0.5169 | |
| | 14 | 0.0400 | 12.15 | 0.810 | 206 2 | 13 44.1 | 337 1 | 22 28.1 | 0.7683 | 1.3044 | 3.42 | 0.5339 | |
| | 15 | 0.0427 | -12.05 | -0.803 | 206 25 | 13 45.7 | 336 3 | 22 24.2 | +0.7662 | +1.3039 | -3.55 | -0.5499 | |
| | 16 | 0.0454 | 11.97 | 0.798 | 206 37 | 13 46.5 | 335 5 | 22 20.3 | 0.7641 | 1.3034 | 3.68 | 0.5653 | |
| | 17 | 0.0482 | 11.86 | 0.791 | 206 46 | 13 47.1 | 334 7 | 22 16.5 | 0.7605 | 1.3029 | 3.81 | 0.5801 | |
| | 18 | 0.0509 | 11.72 | 0.781 | 206 55 | 13 47.7 | 333 9 | 22 12.6 | 0.7557 | 1.3024 | 3.94 | 0.5944 | |
| | 19 | 0.0537 | 11.53 | 0.769 | 207 9 | 13 48.6 | 332 11 | 22 8.7 | 0.7499 | 1.3019 | 4.07 | 0.6083 | |
| | h (8.0) | 20 | 0.0564 | -11.33 | -0.755 | 207 32 | 13 50.1 | 331 12 | 22 4.8 | +0.7434 | +1.3013 | -4.19 | -0.6216 |
| | 21 | 0.0591 | 11.10 | 0.740 | 208 7 | 13 52.5 | 330 14 | 22 0.9 | 0.7369 | 1.3007 | 4.31 | 0.6343 | |
| | 22 | 0.0618 | 10.87 | 0.725 | 208 53 | 13 55.5 | 329 15 | 21 57.0 | 0.7310 | 1.3001 | 4.43 | 0.6465 | |
| | 23 | 0.0646 | 10.66 | 0.711 | 209 48 | 13 59.2 | 328 16 | 21 53.1 | 0.7264 | 1.2995 | 4.55 | 0.6582 | |
| | 24 | 0.0673 | 10.48 | 0.699 | 210 48 | 14 3.2 | 327 17 | 21 49.1 | 0.7233 | 1.2989 | 4.67 | 0.6694 | |
| | 25 | 0.0700 | -10.34 | -0.689 | 211 46 | 14 7.1 | 326 18 | 21 45.2 | +0.7218 | +1.2983 | -4.79 | -0.6800 | |
| | 26 | 0.0727 | 10.25 | 0.683 | 212 37 | 14 10.5 | 325 18 | 21 41.2 | 0.7215 | 1.2977 | 4.91 | 0.6903 | |
| | 27 | 0.0755 | 10.17 | 0.678 | 213 18 | 14 13.2 | 324 19 | 21 37.3 | 0.7220 | 1.2971 | 5.02 | 0.7003 | |
| | 28 | 0.0782 | 10.12 | 0.675 | 213 47 | 14 15.1 | 323 19 | 21 33.3 | 0.7223 | 1.2965 | 5.13 | 0.7100 | |
| | 29 | 0.0810 | 10.07 | 0.671 | 214 5 | 14 16.3 | 322 20 | 21 29.3 | 0.7220 | 1.2959 | 5.24 | 0.7194 | |
| | 30 | 0.0837 | -10.02 | -0.668 | 214 17 | 14 17.1 | 321 20 | 21 25.3 | +0.7203 | +1.2952 | -5.35 | -0.7284 | |
| Feb. | 31 | 0.0864 | 9.93 | 0.662 | 214 27 | 14 17.8 | 320 20 | 21 21.3 | 0.7172 | 1.2946 | 5.46 | 0.7371 | |
| | 1 | 0.0892 | 9.79 | 0.653 | 214 41 | 14 18.7 | 319 19 | 21 17.3 | 0.7127 | 1.2939 | 5.56 | 0.7455 | |
| | 2 | 0.0919 | 9.62 | 0.641 | 215 4 | 14 20.3 | 318 19 | 21 13.3 | 0.7071 | 1.2933 | 5.67 | 0.7536 | |
| | 3 | 0.0947 | 9.42 | 0.628 | 215 40 | 14 22.7 | 317 18 | 21 9.2 | 0.7011 | 1.2926 | 5.77 | 0.7613 | |
| | h (9.0) | 4 | 0.0974 | -9.20 | -0.613 | 216 29 | 14 25.9 | 316 18 | 21 5.2 | +0.6953 | +1.2919 | -5.87 | -0.7687 |
| | 5 | 0.1001 | 8.98 | 0.599 | 217 30 | 14 30.0 | 315 17 | 21 1.1 | 0.6905 | 1.2912 | 5.97 | 0.7759 | |
| | 6 | 0.1029 | 8.78 | 0.585 | 218 38 | 14 34.5 | 314 16 | 20 57.1 | 0.6872 | 1.2906 | 6.07 | 0.7829 | |
| | 7 | 0.1056 | 8.59 | 0.573 | 219 47 | 14 39.1 | 313 15 | 20 53.0 | 0.6856 | 1.2899 | 6.17 | 0.7897 | |
| | 8 | 0.1084 | 8.47 | 0.565 | 220 51 | 14 43.4 | 312 14 | 20 48.9 | 0.6854 | 1.2893 | 6.26 | 0.7962 | |
| | 9 | 0.1111 | -8.37 | -0.558 | 221 44 | 14 46.9 | 311 13 | 20 44.8 | +0.6863 | +1.2886 | -6.35 | -0.8025 | |
| | 10 | 0.1138 | 8.30 | 0.553 | 222 24 | 14 49.6 | 310 11 | 20 40.7 | 0.6873 | 1.2879 | 6.44 | 0.8086 | |
| | 11 | 0.1166 | 8.25 | 0.550 | 222 51 | 14 51.4 | 309 9 | 20 36.6 | 0.6879 | 1.2873 | 6.53 | 0.8144 | |
| | 12 | 0.1193 | 8.20 | 0.547 | 223 10 | 14 52.7 | 308 7 | 20 32.5 | 0.6874 | 1.2866 | 6.61 | 0.8200 | |
| | 13 | 0.1221 | 8.13 | 0.542 | 223 23 | 14 53.5 | 307 5 | 20 28.3 | 0.6853 | 1.2860 | 6.69 | 0.8254 | |
| | 14 | 0.1248 | -8.04 | -0.536 | 223 38 | 14 54.5 | 306 3 | 20 24.2 | +0.6819 | +1.2853 | -6.77 | -0.8306 | |
| | 15 | 0.1275 | -7.91 | -0.527 | 223 59 | 14 55.9 | 305 0 | 20 20.0 | +0.6772 | +1.2847 | -6.85 | -0.8356 | |

FOR WASHINGTON MEAN MIDNIGHT.

| Solar Day. (Sid. Hour.) | τ | f | | G | | H | | Log g . | Log h . | i | Log i . |
|----------------------------|-----------|---------------------|----------|---------------------|----------|----------------------|--------------------|-----------|-----------|-------|-----------|
| | | In Arc. | In Time. | In Arc. | In Time. | In Arc. | In Time. | | | | |
| Feb. | 15 | ^y 0.1275 | -7.91 | ^s -0.527 | 223 59 | ^h 14 55.9 | ^m 305 0 | +0.6772 | +1.2847 | -6.85 | -0.8356 |
| | 16 | 0.1303 | 7.74 | 0.516 | 224 31 | 14 58.1 | 303 57 | 0.6721 | 1.2841 | 6.93 | 0.8404 |
| | 17 | 0.1330 | 7.56 | 0.504 | 225 14 | 15 0.9 | 302 54 | 0.6672 | 1.2835 | 7.00 | 0.8450 |
| | 18 | 0.1358 | 7.37 | 0.491 | 226 10 | 15 4.7 | 301 51 | 0.6631 | 1.2829 | 7.07 | 0.8494 |
| | 19 | 0.1385 | 7.19 | 0.479 | 227 15 | 15 9.0 | 300 48 | 0.6607 | 1.2823 | 7.14 | 0.8537 |
| | (10.0) 20 | 0.1412 | -7.03 | -0.469 | 228 20 | 15 13.3 | 299 45 | +0.6603 | +1.2817 | -7.21 | -0.8577 |
| | 21 | 0.1440 | 6.91 | 0.461 | 229 20 | 15 17.3 | 298 42 | 0.6615 | 1.2811 | 7.28 | 0.8616 |
| | 22 | 0.1467 | 6.83 | 0.455 | 230 9 | 15 20.6 | 297 39 | 0.6641 | 1.2806 | 7.34 | 0.8654 |
| | 23 | 0.1495 | 6.80 | 0.453 | 230 45 | 15 23.0 | 296 35 | 0.6670 | 1.2801 | 7.40 | 0.8690 |
| | 24 | 0.1522 | 6.78 | 0.452 | 231 6 | 15 24.4 | 295 31 | 0.6696 | 1.2796 | 7.46 | 0.8725 |
| Mar. | 25 | 0.1549 | -6.78 | -0.452 | 231 17 | 15 25.1 | 294 27 | +0.6711 | +1.2791 | -7.51 | -0.8758 |
| | 26 | 0.1577 | 6.79 | 0.451 | 231 23 | 15 25.5 | 293 23 | 0.6708 | 1.2786 | 7.56 | 0.8789 |
| | 27 | 0.1604 | 6.72 | 0.448 | 231 29 | 15 25.9 | 292 19 | 0.6689 | 1.2781 | 7.61 | 0.8818 |
| | 28 | 0.1632 | 6.63 | 0.442 | 231 41 | 15 26.7 | 291 15 | 0.6654 | 1.2777 | 7.66 | 0.8846 |
| | 1 | 0.1659 | 6.51 | 0.434 | 232 4 | 15 28.3 | 290 11 | 0.6609 | 1.2773 | 7.71 | 0.8872 |
| | 2 | 0.1686 | -6.35 | -0.423 | 232 41 | 15 30.7 | 289 7 | +0.6560 | +1.2769 | -7.75 | -0.8896 |
| | 3 | 0.1714 | 6.16 | 0.411 | 233 32 | 15 34.1 | 288 3 | 0.6516 | 1.2765 | 7.79 | 0.8919 |
| | 4 | 0.1741 | 5.98 | 0.399 | 234 33 | 15 38.2 | 286 58 | 0.6487 | 1.2761 | 7.83 | 0.8941 |
| | 5 | 0.1769 | 5.80 | 0.387 | 235 39 | 15 42.0 | 285 53 | 0.6475 | 1.2757 | 7.87 | 0.8962 |
| | 6 | 0.1796 | 5.65 | 0.377 | 236 43 | 15 46.9 | 284 48 | 0.6481 | 1.2754 | 7.91 | 0.8982 |
| (11.0) | 7 | 0.1823 | -5.53 | -0.369 | 237 39 | 15 50.6 | 283 44 | +0.6501 | +1.2751 | -7.94 | -0.9001 |
| | 8 | 0.1850 | 5.46 | 0.364 | 238 23 | 15 53.5 | 282 39 | 0.6529 | 1.2748 | 7.97 | 0.9018 |
| | 9 | 0.1878 | 5.41 | 0.361 | 238 53 | 15 55.5 | 281 34 | 0.6554 | 1.2745 | 8.00 | 0.9033 |
| | 10 | 0.1905 | 5.39 | 0.359 | 239 11 | 15 56.7 | 280 29 | 0.6569 | 1.2742 | 8.03 | 0.9046 |
| | 11 | 0.1932 | 5.36 | 0.357 | 239 21 | 15 57.4 | 279 24 | 0.6571 | 1.2740 | 8.05 | 0.9056 |
| | 12 | 0.1959 | -5.32 | -0.355 | 239 27 | 15 57.8 | 278 19 | +0.6554 | +1.2738 | -8.07 | -0.9066 |
| | 13 | 0.1987 | 5.26 | 0.351 | 239 36 | 15 58.4 | 277 14 | 0.6522 | 1.2736 | 8.09 | 0.9075 |
| | 14 | 0.2014 | 5.15 | 0.343 | 239 53 | 15 59.5 | 276 9 | 0.6478 | 1.2735 | 8.10 | 0.9083 |
| | 15 | 0.2042 | 5.03 | 0.335 | 240 21 | 16 1.4 | 275 4 | 0.6428 | 1.2734 | 8.11 | 0.9096 |
| | 16 | 0.2069 | 4.88 | 0.325 | 241 3 | 16 4.2 | 273 58 | 0.6383 | 1.2733 | 8.12 | 0.9097 |
| (12.0) | 17 | 0.2096 | -4.71 | -0.314 | 241 55 | 16 7.7 | 272 53 | +0.6348 | +1.2733 | -8.13 | -0.9102 |
| | 18 | 0.2124 | 4.54 | 0.303 | 242 54 | 16 11.0 | 271 48 | 0.6331 | 1.2733 | 8.13 | 0.9105 |
| | 19 | 0.2151 | 4.39 | 0.293 | 243 52 | 16 15.5 | 270 43 | 0.6334 | 1.2732 | 8.14 | 0.9107 |
| | 20 | 0.2179 | 4.28 | 0.285 | 244 43 | 16 18.9 | 269 38 | 0.6353 | 1.2732 | 8.14 | 0.9107 |
| | 21 | 0.2206 | 4.20 | 0.280 | 245 23 | 16 21.5 | 268 33 | 0.6383 | 1.2732 | 8.14 | 0.9105 |
| | 22 | 0.2233 | -4.18 | -0.279 | 245 48 | 16 23.2 | 267 28 | +0.6414 | +1.2733 | -8.13 | -0.9102 |
| | 23 | 0.2261 | 4.16 | 0.277 | 245 59 | 16 23.9 | 266 23 | 0.6439 | 1.2733 | 8.12 | 0.9098 |
| | 24 | 0.2288 | 4.17 | 0.278 | 246 1 | 16 24.1 | 265 19 | 0.6451 | 1.2734 | 8.11 | 0.9093 |
| | 25 | 0.2316 | 4.17 | 0.278 | 245 58 | 16 23.9 | 264 14 | 0.6443 | 1.2735 | 8.10 | 0.9087 |
| | 26 | 0.2343 | 4.14 | 0.276 | 245 57 | 16 23.8 | 263 10 | 0.6417 | 1.2736 | 8.09 | 0.9079 |
| Apr. | 27 | 0.2370 | -4.09 | -0.273 | 246 4 | 16 24.3 | 262 5 | +0.6375 | +1.2738 | -8.07 | -0.9070 |
| | 28 | 0.2398 | 3.99 | 0.266 | 246 24 | 16 25.6 | 261 1 | 0.6324 | 1.2740 | 8.05 | 0.9060 |
| | 29 | 0.2425 | 3.85 | 0.257 | 246 59 | 16 27.9 | 259 57 | 0.6271 | 1.2742 | 8.03 | 0.9049 |
| | 30 | 0.2453 | 3.68 | 0.245 | 247 48 | 16 31.2 | 258 53 | 0.6223 | 1.2744 | 8.01 | 0.9036 |
| | 31 | 0.2480 | 3.49 | 0.233 | 248 49 | 16 35.3 | 257 49 | 0.6192 | 1.2747 | 7.98 | 0.9022 |
| | 1 | 0.2507 | -3.31 | -0.221 | 249 56 | 16 39.7 | 256 45 | +0.6178 | +1.2750 | -7.95 | -0.9006 |
| | 2 | 0.2535 | -3.15 | -0.210 | 250 59 | 16 43.9 | 255 41 | +0.6184 | +1.2753 | -7.92 | -0.8989 |

FOR WASHINGTON MEAN MIDNIGHT.

| Solar Day. (Sid. Hour.) | τ | f | | G | | H | | Log g . | Log h . | i | Log i . |
|----------------------------|--------|---------|----------|---------|----------|---------|----------|-----------|-----------|-------|-----------|
| | | In Arc. | In Time. | In Arc. | In Time. | In Arc. | In Time. | | | | |
| Apr. | 1 | 0.2507 | -3.31 | -0.221 | 249 56 | 16 39.7 | 256 45 | +0.6178 | +1.2750 | -7.95 | -0.9006 |
| | 2 | 0.2535 | 3.15 | 0.210 | 250 59 | 16 43.9 | 255 41 | 0.6184 | 1.2753 | 7.92 | 0.8989 |
| | 3 | 0.2562 | 3.02 | 0.201 | 251 53 | 16 47.5 | 254 37 | 0.6203 | 1.2756 | 7.89 | 0.8971 |
| | 4 | 0.2590 | 2 93 | 0.195 | 252 33 | 16 50.2 | 253 33 | 0.6229 | 1.2759 | 7.86 | 0.8952 |
| | 5 | 0.2617 | 2.87 | 0.191 | 253 1 | 16 52.1 | 252 30 | 0.6250 | 1.2762 | 7.82 | 0.8932 |
| | 6 | 0.2644 | -2.84 | -0.189 | 253 16 | 16 53.1 | 251 27 | +0.6260 | +1.2766 | -7.78 | -0.8910 |
| | 7 | 0.2672 | 2.81 | 0.187 | 253 25 | 16 53.7 | 250 24 | 0.6253 | 1.2770 | 7.74 | 0.8887 |
| | 8 | 0.2699 | 2.77 | 0.185 | 253 32 | 16 54.1 | 249 21 | 0.6226 | 1.2774 | 7.70 | 0.8862 |
| | 9 | 0.2727 | 2.71 | 0.181 | 253 44 | 16 54.9 | 248 18 | 0.6182 | 1.2778 | 7.65 | 0.8836 |
| | 10 | 0.2754 | 2.62 | 0.175 | 254 6 | 16 56.4 | 247 16 | 0.6125 | 1.2783 | 7.60 | 0.8808 |
| | 11 | 0.2781 | -2.49 | -0.166 | 254 43 | 16 58.9 | 246 13 | +0.6064 | +1.2788 | -7.55 | -0.8779 |
| | 12 | 0.2809 | 2.33 | 0.155 | 255 33 | 17 2.2 | 245 11 | 0.6009 | 1.2793 | 7.50 | 0.8748 |
| | 13 | 0.2836 | 2.14 | 0.143 | 256 35 | 17 6.3 | 244 8 | 0.5966 | 1.2798 | 7.44 | 0.8716 |
| | 14 | 0.2864 | 1.96 | 0.131 | 257 43 | 17 10.9 | 243 6 | 0.5944 | 1.2803 | 7.38 | 0.8682 |
| | 15 | 0.2891 | 1.79 | 0.119 | 258 50 | 17 15.3 | 242 4 | 0.5942 | 1.2808 | 7.32 | 0.8646 |
| | 16 | 0.2918 | -1.65 | -0.110 | 259 47 | 17 19.1 | 241 2 | +0.5959 | +1.2813 | -7.26 | -0.8609 |
| | 17 | 0.2946 | 1.54 | 0.103 | 260 30 | 17 22.0 | 240 1 | 0.5986 | 1.2818 | 7.20 | 0.8570 |
| | 18 | 0.2973 | 1.48 | 0.099 | 260 59 | 17 23.9 | 239 0 | 0.6013 | 1.2824 | 7.13 | 0.8530 |
| | 19 | 0.3001 | 1.44 | 0.096 | 261 14 | 17 24.9 | 237 59 | 0.6032 | 1.2830 | 7.06 | 0.8488 |
| | 20 | 0.3028 | 1.43 | 0.095 | 261 20 | 17 25.3 | 236 58 | 0.6034 | 1.2836 | 6.99 | 0.8445 |
| h (14.0) | 21 | 0.3055 | -1.41 | -0.094 | 261 24 | 17 25.6 | 235 58 | +0.6016 | +1.2842 | -6.92 | -0.8400 |
| | 22 | 0.3083 | 1.38 | 0.092 | 261 33 | 17 26.2 | 234 58 | 0.5977 | 1.2848 | 6.85 | 0.8353 |
| | 23 | 0.3110 | 1.31 | 0.087 | 261 52 | 17 27.5 | 233 57 | 0.5924 | 1.2854 | 6.77 | 0.8304 |
| | 24 | 0.3138 | 1.20 | 0.080 | 262 28 | 17 29.9 | 232 57 | 0.5862 | 1.2860 | 6.69 | 0.8254 |
| | 25 | 0.3165 | 1.05 | 0.070 | 263 22 | 17 33.5 | 231 57 | 0.5800 | 1.2866 | 6.61 | 0.8203 |
| | 26 | 0.3192 | -0.86 | -0.057 | 264 32 | 17 38.1 | 230 58 | +0.5750 | +1.2872 | -6.53 | -0.8150 |
| | 27 | 0.3219 | 0.66 | 0.044 | 265 52 | 17 43.5 | 229 58 | 0.5720 | 1.2878 | 6.45 | 0.8094 |
| | 28 | 0.3247 | 0.45 | 0.030 | 267 16 | 17 49.1 | 228 59 | 0.5718 | 1.2884 | 6.37 | 0.8036 |
| | 29 | 0.3274 | 0.25 | 0.017 | 268 36 | 17 54.4 | 228 0 | 0.5731 | 1.2890 | 6.28 | 0.7976 |
| | 30 | 0.3301 | -0.08 | -0.005 | 269 43 | 17 58.9 | 227 1 | 0.5759 | 1.2897 | 6.19 | 0.7914 |
| May | 1 | 0.3328 | +0.05 | +0.003 | 270 36 | 18 2.4 | 226 2 | +0.5792 | +1.2903 | -6.10 | -0.7850 |
| | 2 | 0.3356 | 0.15 | 0.010 | 271 14 | 18 4.9 | 225 3 | 0.5821 | 1.2910 | 6.01 | 0.7784 |
| | 3 | 0.3383 | 0.22 | 0.015 | 271 41 | 18 6.7 | 224 5 | 0.5834 | 1.2916 | 5.92 | 0.7716 |
| | 4 | 0.3411 | 0.28 | 0.019 | 272 4 | 18 8.3 | 223 7 | 0.5830 | 1.2923 | 5.82 | 0.7645 |
| | 5 | 0.3438 | 0.34 | 0.023 | 272 30 | 18 10.0 | 222 9 | 0.5803 | 1.2929 | 5.72 | 0.7572 |
| | 6 | 0.3465 | +0.42 | +0.028 | 273 4 | 18 12.3 | 221 11 | +0.5760 | +1.2935 | -5.62 | -0.7497 |
| | 7 | 0.3493 | 0.54 | 0.036 | 273 53 | 18 15.5 | 220 13 | 0.5707 | 1.2942 | 5.52 | 0.7419 |
| | 8 | 0.3520 | 0.69 | 0.046 | 274 58 | 18 19.9 | 219 16 | 0.5653 | 1.2948 | 5.42 | 0.7338 |
| | 9 | 0.3548 | 0.88 | 0.059 | 276 18 | 18 25.2 | 218 19 | 0.5611 | 1.2954 | 5.32 | 0.7254 |
| | 10 | 0.3575 | 1.09 | 0.073 | 277 47 | 18 31.1 | 217 22 | 0.5588 | 1.2960 | 5.21 | 0.7167 |
| | 11 | 0.3602 | +1.31 | +0.087 | 279 19 | 18 37.3 | 216 25 | +0.5591 | +1.2966 | -5.10 | -0.7077 |
| | 12 | 0.3630 | 1.52 | 0.101 | 280 43 | 18 42.9 | 215 29 | 0.5616 | 1.2972 | 4.99 | 0.6984 |
| | 13 | 0.3657 | 1.70 | 0.113 | 281 54 | 18 47.6 | 214 33 | 0.5659 | 1.2978 | 4.88 | 0.6888 |
| | 14 | 0.3685 | 1.85 | 0.123 | 282 48 | 18 51.2 | 213 37 | 0.5709 | 1.2984 | 4.77 | 0.6789 |
| | 15 | 0.3712 | 1.97 | 0.131 | 283 25 | 18 53.7 | 212 41 | 0.5755 | 1.2990 | 4.66 | 0.6688 |
| | 16 | 0.3739 | +2.04 | +0.136 | 283 50 | 18 55.3 | 211 45 | +0.5789 | +1.2996 | -4.55 | -0.6583 |
| | 17 | 0.3767 | +2.10 | +0.140 | 284 10 | 18 56.7 | 210 49 | +0.5804 | +1.3001 | -4.44 | -0.6473 |

FOR WASHINGTON MEAN MIDNIGHT.

| Solar Day. (Sid. Hour.) | τ | f | | G | | H | | Log g . | Log h . | i | Log i . |
|----------------------------|-----------|---------|----------|---------|----------|---------|----------|-----------|-----------|-------|-----------|
| | | In Arc. | In Time. | In Arc. | In Time. | In Arc. | In Time. | | | | |
| May | 17 | 0.3767 | +2.10 | +0.140 | 284 10 | 18 56.7 | 210 49 | +0.5801 | +1.3001 | -4.44 | -0.6473 |
| | 18 | 0.3794 | 2.15 | 0.143 | 284 30 | 18 58.0 | 209 53 | 0.5799 | 1.3007 | 4.33 | 0.6358 |
| | 19 | 0.3822 | 2.21 | 0.147 | 284 59 | 18 59.9 | 208 58 | 0.5776 | 1.3012 | 4.21 | 0.6239 |
| | 20 | 0.3849 | 2.30 | 0.153 | 285 45 | 19 3.0 | 208 3 | 0.5742 | 1.3017 | 4.09 | 0.6115 |
| | 21 | 0.3876 | 2.43 | 0.162 | 286 46 | 19 7.1 | 207 8 | 0.5707 | 1.3022 | 3.97 | 0.5986 |
| | 22 | 0.3904 | +2.60 | +0.173 | 288 5 | 19 12.3 | 206 13 | +0.5680 | +1.3027 | -3.85 | -0.5852 |
| | (16.0) 23 | 0.3931 | 2.81 | 0.187 | 289 36 | 19 18.4 | 205 18 | 0.5674 | 1.3032 | 3.73 | 0.5713 |
| | 24 | 0.3959 | 3.04 | 0.203 | 291 12 | 19 24.8 | 204 23 | 0.5692 | 1.3037 | 3.61 | 0.5569 |
| | 25 | 0.3986 | 3.28 | 0.219 | 292 43 | 19 30.9 | 203 29 | 0.5736 | 1.3042 | 3.48 | 0.5421 |
| | 26 | 0.4013 | 3.52 | 0.235 | 294 3 | 19 36.2 | 202 35 | 0.5799 | 1.3046 | 3.36 | 0.5267 |
| | 27 | 0.4041 | +3.73 | +0.249 | 295 8 | 19 40.5 | 201 41 | +0.5872 | +1.3051 | -3.24 | -0.5104 |
| | 28 | 0.4068 | 3.91 | 0.261 | 295 56 | 19 43.7 | 200 47 | 0.5944 | 1.3055 | 3.12 | 0.4932 |
| | 29 | 0.4096 | 4.04 | 0.269 | 296 29 | 19 45.9 | 199 53 | 0.6005 | 1.3059 | 2.99 | 0.4750 |
| | 30 | 0.4123 | 4.16 | 0.277 | 296 59 | 19 47.9 | 198 59 | 0.6051 | 1.3063 | 2.86 | 0.4559 |
| | 31 | 0.4150 | 4.25 | 0.283 | 297 27 | 19 49.8 | 198 5 | 0.6077 | 1.3067 | 2.73 | 0.4361 |
| June | 1 | 0.4178 | +4.34 | +0.289 | 298 1 | 19 52.1 | 197 12 | +0.6086 | +1.3071 | -2.60 | -0.4151 |
| | 2 | 0.4205 | 4.45 | 0.297 | 298 46 | 19 55.1 | 196 18 | 0.6083 | 1.3074 | 2.47 | 0.3930 |
| | 3 | 0.4233 | 4.58 | 0.305 | 299 44 | 19 58.9 | 195 25 | 0.6077 | 1.3077 | 2.34 | 0.3697 |
| | 4 | 0.4260 | 4.75 | 0.317 | 300 57 | 20 3.8 | 194 32 | 0.6077 | 1.3080 | 2.21 | 0.3447 |
| | 5 | 0.4287 | 4.96 | 0.331 | 302 19 | 20 9.3 | 193 38 | 0.6093 | 1.3083 | 2.08 | 0.3181 |
| | 6 | 0.4315 | +5.19 | +0.346 | 303 43 | 20 14.9 | 192 45 | +0.6129 | +1.3086 | -1.95 | -0.2897 |
| | (17.0) 7 | 0.4342 | 5.44 | -0.363 | 305 0 | 20 20.0 | 191 52 | 0.6188 | 1.3088 | 1.82 | 0.2593 |
| | 8 | 0.4370 | 5.68 | 0.379 | 306 5 | 20 24.3 | 190 59 | 0.6257 | 1.3091 | 1.69 | 0.2263 |
| | 9 | 0.4397 | 5.90 | 0.393 | 306 55 | 20 27.7 | 190 6 | 0.6338 | 1.3093 | 1.55 | 0.1905 |
| | 10 | 0.4424 | 6.09 | 0.406 | 307 28 | 20 29.9 | 189 13 | 0.6418 | 1.3095 | 1.42 | 0.1513 |
| | 11 | 0.4451 | +6.24 | +0.416 | 307 48 | 20 31.2 | 188 20 | +0.6490 | +1.3097 | -1.28 | -0.1082 |
| | 12 | 0.4479 | 6.35 | 0.423 | 308 0 | 20 32.0 | 187 27 | 0.6547 | 1.3099 | 1.15 | 0.0601 |
| | 13 | 0.4506 | 6.43 | 0.429 | 308 10 | 20 32.7 | 186 34 | 0.6587 | 1.3101 | 1.01 | 0.0060 |
| | 14 | 0.4533 | 6.50 | 0.433 | 308 24 | 20 33.6 | 185 42 | 0.6610 | 1.3102 | 0.88 | 0.9439 |
| | 15 | 0.4560 | 6.58 | 0.439 | 308 48 | 20 35.2 | 184 49 | 0.6623 | 1.3103 | 0.74 | 0.8714 |
| | 16 | 0.4588 | +6.68 | +0.445 | 309 24 | 20 37.6 | 183 56 | +0.6631 | +1.3104 | -0.61 | -0.7840 |
| | 17 | 0.4615 | 6.81 | 0.454 | 310 14 | 20 40.9 | 183 4 | 0.6642 | 1.3105 | 0.47 | 0.6737 |
| | 18 | 0.4643 | 6.98 | 0.465 | 311 13 | 20 44.9 | 182 12 | 0.6664 | 1.3105 | 0.34 | 0.5244 |
| | 19 | 0.4670 | 7.20 | 0.480 | 312 18 | 20 49.2 | 181 20 | 0.6703 | 1.3106 | 0.20 | 0.2873 |
| | 20 | 0.4697 | 7.44 | 0.496 | 313 20 | 20 53.3 | 180 28 | 0.6760 | 1.3106 | -0.07 | -8.8401 |
| | 21 | 0.4725 | +7.70 | +0.513 | 314 15 | 20 57.0 | 179 35 | +0.6834 | +1.3106 | +0.07 | +8.8215 |
| | (18.0) 22 | 0.4752 | 7.95 | 0.530 | 314 58 | 20 59.9 | 178 43 | 0.6919 | 1.3106 | 0.20 | 0.2697 |
| | 23 | 0.4780 | 8.18 | 0.545 | 315 28 | 21 1.9 | 177 50 | 0.7007 | 1.3105 | 0.34 | 0.5219 |
| | 24 | 0.4807 | 8.38 | 0.559 | 315 46 | 21 3.1 | 176 57 | 0.7089 | 1.3105 | 0.47 | 0.6711 |
| | 25 | 0.4834 | 8.54 | 0.569 | 315 55 | 21 3.7 | 176 5 | 0.7161 | 1.3104 | 0.60 | 0.7817 |
| | 26 | 0.4862 | +8.67 | +0.578 | 316 1 | 21 4.1 | 175 12 | +0.7219 | +1.3103 | +0.74 | +9.8694 |
| | 27 | 0.4889 | 8.78 | 0.585 | 316 9 | 21 4.6 | 174 20 | 0.7262 | 1.3102 | 0.87 | 0.9421 |
| | 28 | 0.4917 | 8.88 | 0.592 | 316 23 | 21 5.5 | 173 27 | 0.7291 | 1.3101 | 1.01 | 0.0044 |
| | 29 | 0.4944 | 8.98 | 0.599 | 316 46 | 21 7.1 | 172 34 | 0.7314 | 1.3099 | 1.14 | 0.0685 |
| | 30 | 0.4971 | 9.11 | 0.607 | 317 19 | 21 9.3 | 171 41 | 0.7337 | 1.3097 | 1.27 | 0.1066 |
| July | 1 | 0.4999 | +9.27 | +0.618 | 318 2 | 21 12.1 | 170 49 | +0.7364 | +1.3095 | +1.41 | +0.1499 |
| | 2 | 0.5026 | +9.47 | +0.631 | 318 49 | 21 15.3 | 169 56 | +0.7402 | +1.3093 | +1.54 | +0.1890 |

FOR WASHINGTON MEAN MIDNIGHT.

| Solar Day. (Sid. Hour.) | τ | f | | G | | H | | Log g . | Log h . | i | Log i . |
|----------------------------|--------|---------|----------|---------|----------|---------|----------|-----------|-----------|-------|-----------|
| | | In Arc. | In Time. | In Arc. | In Time. | In Arc. | In Time. | | | | |
| July | 1 | 0.4999 | + 9.27 | +0.618 | 318 2 | 21 12.1 | 170 49 | +0.7364 | +1.3095 | +1.41 | +0.1499 |
| | 2 | 0.5026 | 9.47 | 0.631 | 318 49 | 21 15.3 | 169 56 | 0.7402 | 1.3093 | 1.54 | 0.1890 |
| | 3 | 0.5054 | 9.70 | 0.647 | 319 37 | 21 18.5 | 169 4 | 0.7454 | 1.3091 | 1.68 | 0.2248 |
| | 4 | 0.5081 | 9.95 | 0.663 | 320 18 | 21 21.2 | 168 11 | 0.7518 | 1.3089 | 1.81 | 0.2578 |
| | 5 | 0.5108 | 10.19 | 0.679 | 320 50 | 21 23.3 | 167 18 | 0.7591 | 1.3086 | 1.94 | 0.2883 |
| | 6 | 0.5136 | +10.42 | +0.695 | 321 9 | 21 24.6 | 166 25 | +0.7667 | +1.3083 | +2.07 | +0.3167 |
| | (19.0) | 0.5163 | 10.62 | 0.708 | 321 18 | 21 25.2 | 165 32 | 0.7741 | 1.3080 | 2.20 | 0.3433 |
| | 8 | 0.5191 | 10.77 | 0.718 | 321 17 | 21 25.1 | 164 39 | 0.7805 | 1.3077 | 2.33 | 0.3682 |
| | 9 | 0.5218 | 10.89 | 0.726 | 321 11 | 21 24.7 | 163 46 | 0.7858 | 1.3074 | 2.46 | 0.3916 |
| | 10 | 0.5245 | 10.98 | 0.732 | 321 4 | 21 24.3 | 162 53 | 0.7899 | 1.3071 | 2.59 | 0.4138 |
| | 11 | 0.5273 | +11.05 | +0.737 | 321 1 | 21 24.0 | 162 0 | +0.7927 | +1.3068 | +2.72 | +0.4347 |
| | 12 | 0.5300 | 11.11 | 0.741 | 321 6 | 21 24.3 | 161 6 | 0.7947 | 1.3064 | 2.85 | 0.4546 |
| | 13 | 0.5328 | 11.19 | 0.746 | 321 20 | 21 25.3 | 160 12 | 0.7964 | 1.3060 | 2.98 | 0.4735 |
| | 14 | 0.5355 | 11.31 | 0.754 | 321 43 | 21 26.9 | 159 18 | 0.7984 | 1.3056 | 3.10 | 0.4914 |
| | 15 | 0.5382 | 11.45 | 0.763 | 322 14 | 21 28.9 | 158 24 | 0.8010 | 1.3052 | 3.23 | 0.5085 |
| | 16 | 0.5410 | +11.64 | +0.776 | 322 48 | 21 31.2 | 157 30 | +0.8048 | +1.3047 | +3.35 | +0.5249 |
| | 17 | 0.5437 | 11.86 | 0.791 | 323 20 | 21 33.3 | 156 36 | 0.8099 | 1.3042 | 3.47 | 0.5406 |
| | 18 | 0.5465 | 12.10 | 0.807 | 323 47 | 21 35.1 | 155 42 | 0.8161 | 1.3038 | 3.59 | 0.5556 |
| | 19 | 0.5492 | 12.34 | 0.823 | 324 5 | 21 36.3 | 154 47 | 0.8229 | 1.3033 | 3.71 | 0.5700 |
| | 20 | 0.5519 | 12.56 | 0.837 | 324 13 | 21 36.9 | 153 53 | 0.8300 | 1.3028 | 3.83 | 0.5838 |
| | 21 | 0.5547 | +12.76 | +0.851 | 324 15 | 21 37.0 | 152 59 | +0.8366 | +1.3023 | +3.95 | +0.5971 |
| | 22 | 0.5574 | 12.91 | 0.861 | 324 8 | 21 36.5 | 152 4 | 0.8423 | 1.3018 | 4.07 | 0.6099 |
| | (20.0) | 0.5602 | 13.03 | 0.869 | 324 0 | 21 36.0 | 151 9 | 0.8470 | 1.3013 | 4.19 | 0.6222 |
| | 24 | 0.5629 | 13.12 | 0.875 | 323 53 | 21 35.5 | 150 14 | 0.8506 | 1.3007 | 4.30 | 0.6339 |
| | 25 | 0.5656 | 13.20 | 0.880 | 323 52 | 21 35.5 | 149 19 | 0.8533 | 1.3002 | 4.42 | 0.6452 |
| | 26 | 0.5684 | +13.27 | +0.885 | 323 58 | 21 35.9 | 148 23 | +0.8553 | +1.2996 | +4.53 | +0.6562 |
| | 27 | 0.5711 | 13.38 | 0.892 | 324 11 | 21 36.7 | 147 28 | 0.8572 | 1.2991 | 4.65 | 0.6669 |
| | 28 | 0.5739 | 13.51 | 0.901 | 324 32 | 21 38.1 | 146 32 | 0.8595 | 1.2985 | 4.76 | 0.6773 |
| | 29 | 0.5766 | 13.67 | 0.911 | 324 57 | 21 39.8 | 145 37 | 0.8626 | 1.2979 | 4.87 | 0.6873 |
| | 30 | 0.5793 | 13.87 | 0.925 | 325 23 | 21 41.5 | 144 41 | 0.8664 | 1.2973 | 4.98 | 0.6969 |
| | 31 | 0.5820 | +14.08 | +0.939 | 325 46 | 21 43.1 | 143 45 | +0.8711 | +1.2967 | +5.09 | +0.7061 |
| Aug. | 1 | 0.5848 | 14.30 | 0.953 | 326 0 | 21 44.0 | 142 49 | 0.8767 | 1.2961 | 5.20 | 0.7150 |
| | 2 | 0.5875 | 14.51 | 0.967 | 326 9 | 21 44.6 | 141 53 | 0.8823 | 1.2955 | 5.30 | 0.7236 |
| | 3 | 0.5902 | 14.70 | 0.980 | 326 8 | 21 44.5 | 140 56 | 0.8878 | 1.2949 | 5.40 | 0.7319 |
| | 4 | 0.5929 | 14.84 | 0.989 | 325 59 | 21 43.9 | 139 59 | 0.8928 | 1.2943 | 5.50 | 0.7399 |
| | 5 | 0.5957 | +14.94 | +0.996 | 325 47 | 21 43.1 | 139 2 | +0.8968 | +1.2937 | +5.60 | +0.7477 |
| | 6 | 0.5984 | 15.01 | 1.001 | 325 33 | 21 42.2 | 138 5 | 0.8998 | 1.2931 | 5.70 | 0.7553 |
| | (21.0) | 0.6012 | 15.05 | 1.003 | 325 22 | 21 41.5 | 137 8 | 0.9018 | 1.2925 | 5.80 | 0.7626 |
| | 8 | 0.6039 | 15.08 | 1.005 | 325 17 | 21 41.1 | 136 11 | 0.9032 | 1.2918 | 5.89 | 0.7697 |
| | 9 | 0.6066 | 15.13 | 1.009 | 325 20 | 21 41.3 | 135 13 | 0.9043 | 1.2912 | 5.98 | 0.7765 |
| | 10 | 0.6094 | +15.19 | +1.013 | 325 30 | 21 42.0 | 134 15 | +0.9053 | +1.2906 | +6.07 | +0.7831 |
| | 11 | 0.6121 | 15.29 | 1.019 | 325 45 | 21 43.0 | 133 17 | 0.9069 | 1.2900 | 6.16 | 0.7895 |
| | 12 | 0.6149 | 15.44 | 1.029 | 326 6 | 21 44.4 | 132 19 | 0.9093 | 1.2894 | 6.25 | 0.7957 |
| | 13 | 0.6176 | 15.62 | 1.041 | 326 25 | 21 45.7 | 131 21 | 0.9127 | 1.2887 | 6.33 | 0.8017 |
| | 14 | 0.6203 | 15.82 | 1.055 | 326 42 | 21 46.8 | 130 22 | 0.9169 | 1.2881 | 6.42 | 0.8075 |
| | 15 | 0.6231 | +16.03 | +1.069 | 326 51 | 21 47.4 | 129 23 | +0.9218 | +1.2874 | +6.50 | +0.8131 |
| | 16 | 0.6258 | +16.23 | +1.082 | 326 54 | 21 47.6 | 128 24 | +0.9267 | +1.2868 | +6.58 | +0.8185 |

FOR WASHINGTON MEAN MIDNIGHT.

| Solar Day. (Sid. Hour.) | | τ | f | | G | | H | | Log g . | Log h . | i | Log i . | | |
|----------------------------|--------|--------|---------|----------|---------|----------|---------|----------|-----------|-----------|---------|-----------|---------|---------|
| | | | In Arc. | In Time. | In Arc. | In Time. | In Arc. | In Time. | | | | | | |
| Aug. | 16 | 0.6258 | +16.23 | +1.082 | 326 54 | 21 47.6 | 128 24 | 8 23.6 | +0.9267 | +1.2868 | +6.58 | +0.8185 | | |
| | 17 | 0.6286 | 16.40 | 1.093 | 326 51 | 21 47.4 | 127 25 | 8 29.7 | 0.9315 | 1.2862 | 6.66 | 0.8237 | | |
| | 18 | 0.6313 | 16.54 | 1.103 | 326 42 | 21 46.8 | 126 26 | 8 25.7 | 0.9359 | 1.2856 | 6.74 | 0.8286 | | |
| | 19 | 0.6340 | 16.63 | 1.109 | 326 31 | 21 46.1 | 125 26 | 8 21.7 | 0.9393 | 1.2850 | 6.82 | 0.8334 | | |
| | 20 | 0.6368 | 16.70 | 1.113 | 326 20 | 21 45.3 | 124 26 | 8 17.7 | 0.9420 | 1.2844 | 6.89 | 0.8381 | | |
| | (22.0) | 21 | 0.6395 | +16.74 | +1.116 | 326 14 | 21 44.9 | 123 26 | 8 13.7 | +0.9438 | +1.2838 | +6.96 | +0.8426 | |
| | | 22 | 0.6423 | 16.79 | 1.119 | 326 13 | 21 44.9 | 122 26 | 8 9.7 | 0.9449 | 1.2832 | 7.03 | 0.8470 | |
| | | 23 | 0.6450 | 16.85 | 1.123 | 326 19 | 21 45.3 | 121 26 | 8 5.7 | 0.9459 | 1.2827 | 7.10 | 0.8513 | |
| | | 24 | 0.6477 | 16.92 | 1.128 | 326 31 | 21 46.1 | 120 25 | 8 1.6 | 0.9470 | 1.2821 | 7.17 | 0.8554 | |
| | | 25 | 0.6505 | 17.04 | 1.136 | 326 47 | 21 47.1 | 119 24 | 7 57.6 | 0.9487 | 1.2816 | 7.23 | 0.8593 | |
| | | 26 | 0.6532 | +17.20 | +1.147 | 327 6 | 21 48.4 | 118 23 | 7 53.5 | +0.9511 | +1.2810 | +7.29 | +0.8630 | |
| | | 27 | 0.6560 | 17.30 | 1.159 | 327 24 | 21 49.6 | 117 22 | 7 49.5 | 0.9542 | 1.2805 | 7.35 | 0.8665 | |
| | | 28 | 0.6587 | 17.57 | 1.171 | 327 36 | 21 50.4 | 116 21 | 7 45.4 | 0.9579 | 1.2800 | 7.41 | 0.8698 | |
| | | 29 | 0.6614 | 17.75 | 1.183 | 327 42 | 21 50.8 | 115 20 | 7 41.3 | 0.9619 | 1.2795 | 7.47 | 0.8730 | |
| | | 30 | 0.6642 | 17.92 | 1.195 | 327 40 | 21 50.7 | 114 19 | 7 37.3 | 0.9660 | 1.2790 | 7.52 | 0.8761 | |
| | Sept. | 31 | 0.6669 | +18.04 | +1.203 | 327 34 | 21 50.3 | 113 17 | 7 33.1 | +0.9695 | +1.2786 | +7.57 | +0.8791 | |
| | | 1 | 0.6697 | 18.13 | 1.209 | 327 22 | 21 49.5 | 112 15 | 7 29.0 | 0.9725 | 1.2782 | 7.62 | 0.8819 | |
| | | 2 | 0.6724 | 18.18 | 1.212 | 327 9 | 21 48.6 | 111 13 | 7 24.9 | 0.9747 | 1.2777 | 7.67 | 0.8846 | |
| | | 3 | 0.6751 | 18.19 | 1.213 | 326 58 | 21 47.9 | 110 11 | 7 20.7 | 0.9759 | 1.2773 | 7.71 | 0.8872 | |
| | | 4 | 0.6779 | 18.20 | 1.213 | 326 52 | 21 47.5 | 109 9 | 7 16.6 | 0.9766 | 1.2769 | 7.75 | 0.8896 | |
| | | (23.0) | 5 | 0.6806 | +18.21 | +1.214 | 326 52 | 21 47.5 | 108 6 | 7 12.4 | +0.9768 | +1.2765 | +7.79 | +0.8919 |
| | | | 6 | 0.6834 | 18.23 | 1.215 | 326 58 | 21 47.9 | 107 4 | 7 8.3 | 0.9769 | 1.2761 | 7.83 | 0.8941 |
| | | | 7 | 0.6861 | 18.29 | 1.219 | 327 10 | 21 48.7 | 106 1 | 7 4.1 | 0.9774 | 1.2758 | 7.87 | 0.8961 |
| | | | 8 | 0.6888 | 18.40 | 1.227 | 327 26 | 21 49.7 | 104 58 | 6 59.9 | 0.9786 | 1.2755 | 7.90 | 0.8979 |
| | | | 9 | 0.6916 | 18.54 | 1.236 | 327 44 | 21 50.9 | 103 55 | 6 55.7 | 0.9804 | 1.2752 | 7.93 | 0.8996 |
| | | 10 | 0.6943 | +18.71 | +1.247 | 327 59 | 21 51.9 | 102 52 | 6 51.5 | +0.9832 | +1.2749 | +7.96 | +0.9012 | |
| | | 11 | 0.6971 | 18.88 | 1.259 | 328 9 | 21 52.6 | 101 49 | 6 47.3 | 0.9865 | 1.2746 | 7.99 | 0.9027 | |
| | | 12 | 0.6998 | 19.07 | 1.271 | 328 15 | 21 53.0 | 100 46 | 6 43.1 | 0.9902 | 1.2743 | 8.02 | 0.9041 | |
| | | 13 | 0.7025 | 19.22 | 1.281 | 328 14 | 21 52.9 | 99 43 | 6 38.9 | 0.9938 | 1.2741 | 8.04 | 0.9053 | |
| | | 14 | 0.7053 | 19.34 | 1.289 | 328 8 | 21 52.5 | 98 39 | 6 34.6 | 0.9969 | 1.2739 | 8.06 | 0.9064 | |
| 15 | | 0.7080 | +19.43 | +1.295 | 328 1 | 21 52.1 | 97 35 | 6 30.3 | +0.9995 | +1.2737 | +8.08 | +0.9074 | | |
| 16 | | 0.7108 | 19.49 | 1.299 | 327 52 | 21 51.5 | 96 31 | 6 26.1 | 1.0014 | 1.2735 | 8.10 | 0.9082 | | |
| 17 | | 0.7135 | 19.51 | 1.301 | 327 47 | 21 51.1 | 95 27 | 6 21.8 | 1.0025 | 1.2734 | 8.11 | 0.9089 | | |
| 18 | | 0.7162 | 19.54 | 1.303 | 327 47 | 21 51.1 | 94 23 | 6 17.5 | 1.0030 | 1.2733 | 8.12 | 0.9095 | | |
| 19 | | 0.7189 | 19.57 | 1.305 | 327 52 | 21 51.5 | 93 19 | 6 13.3 | 1.0033 | 1.2732 | 8.12 | 0.9100 | | |
| (24.0) | 20 | 0.7217 | +19.63 | +1.309 | 328 4 | 21 52.3 | 92 15 | 6 9.0 | +1.0037 | +1.2732 | +8.13 | +0.9103 | | |
| | 21 | 0.7244 | 19.72 | 1.315 | 328 20 | 21 53.3 | 91 11 | 6 4.7 | 1.0044 | 1.2731 | 8.13 | 0.9105 | | |
| | 22 | 0.7271 | 19.85 | 1.323 | 328 39 | 21 54.6 | 90 7 | 6 0.5 | 1.0057 | 1.2731 | 8.14 | 0.9106 | | |
| | 23 | 0.7298 | 20.01 | 1.334 | 328 58 | 21 55.9 | 89 3 | 5 56.2 | 1.0078 | 1.2731 | 8.14 | 0.9105 | | |
| | 24 | 0.7326 | 20.19 | 1.346 | 329 13 | 21 56.9 | 87 59 | 5 51.9 | 1.0105 | 1.2732 | 8.13 | 0.9103 | | |
| | 25 | 0.7353 | +20.36 | +1.357 | 329 24 | 21 57.6 | 86 55 | 5 47.7 | +1.0134 | +1.2732 | +8.13 | +0.9100 | | |
| | 26 | 0.7381 | 20.52 | 1.368 | 329 27 | 21 57.8 | 85 51 | 5 43.4 | 1.0165 | 1.2733 | 8.12 | 0.9096 | | |
| | 27 | 0.7408 | 20.65 | 1.377 | 329 25 | 21 57.7 | 84 47 | 5 39.1 | 1.0194 | 1.2734 | 8.11 | 0.9091 | | |
| | 28 | 0.7435 | 20.74 | 1.383 | 329 20 | 21 57.3 | 83 43 | 5 34.9 | 1.0217 | 1.2735 | 8.10 | 0.9085 | | |
| | 29 | 0.7463 | 20.79 | 1.386 | 329 12 | 21 56.8 | 82 39 | 5 30.6 | 1.0233 | 1.2737 | 8.08 | 0.9077 | | |
| Oct. | 30 | 0.7490 | +20.80 | +1.387 | 329 5 | 21 56.3 | 81 35 | 5 26.3 | +1.0243 | +1.2739 | +8.06 | +0.9068 | | |
| | 1 | 0.7518 | +20.80 | +1.387 | 329 2 | 21 56.1 | 80 31 | 5 22.1 | +1.0245 | +1.2741 | +8.04 | +0.9057 | | |

FOR WASHINGTON MEAN MIDNIGHT.

| Solar Day. (Std. Hour.) | τ | f | | G | | H | | Log g . | Log h . | i | Log i . |
|----------------------------|----------------------|---------|----------|---------|----------|---------|----------|-----------|-----------|-------|-----------|
| | | In Arc. | In Time. | In Arc. | In Time. | In Arc. | In Time. | | | | |
| Oct. | γ 1 0.7518 | +20.80 | +1.387 | 329 2 | 21 56.1 | 80 31 | 5 22.1 | +1.0245 | +1.2741 | +8.04 | +0.9057 |
| | 2 0.7545 | 20.80 | 1.387 | 329 4 | 21 56.2 | 79 27 | 5 17.8 | 1.0242 | 1.2743 | 8.02 | 0.9044 |
| | 3 0.7572 | 20.82 | 1.388 | 329 12 | 21 56.8 | 78 23 | 5 13.5 | 1.0240 | 1.2745 | 7.99 | 0.9030 |
| | 4 0.7600 | 20.87 | 1.391 | 329 26 | 21 57.7 | 77 19 | 5 9.3 | 1.0240 | 1.2748 | 7.96 | 0.9015 |
| | 5 0.7627 | 20.96 | 1.397 | 329 44 | 21 58.9 | 76 15 | 5 5.0 | 1.0245 | 1.2751 | 7.93 | 0.8999 |
| | δ 6 0.7655 | +21.09 | +1.406 | 330 4 | 22 0.3 | 75 11 | 5 0.7 | +1.0258 | +1.2754 | +7.90 | +0.8981 |
| | (1.0) 7 0.7682 | 21.25 | 1.417 | 330 22 | 22 1.5 | 74 7 | 4 56.5 | 1.0278 | 1.2757 | 7.87 | 0.8962 |
| | 8 0.7709 | 21.44 | 1.429 | 330 37 | 22 2.5 | 73 3 | 4 52.2 | 1.0304 | 1.2761 | 7.83 | 0.8941 |
| | 9 0.7737 | 21.62 | 1.441 | 330 48 | 22 3.2 | 71 59 | 4 47.9 | 1.0333 | 1.2765 | 7.79 | 0.8919 |
| | 10 0.7764 | 21.79 | 1.453 | 330 52 | 22 3.5 | 70 55 | 4 43.7 | 1.0364 | 1.2769 | 7.75 | 0.8896 |
| | 11 0.7792 | +21.93 | +1.462 | 330 52 | 22 3.5 | 69 51 | 4 39.4 | +1.0391 | +1.2773 | +7.71 | +0.8872 |
| | 12 0.7819 | 22.03 | 1.469 | 330 50 | 22 3.3 | 68 48 | 4 35.2 | 1.0414 | 1.2777 | 7.67 | 0.8847 |
| | 13 0.7846 | 22.11 | 1.474 | 330 46 | 22 3.1 | 67 44 | 4 30.9 | 1.0431 | 1.2781 | 7.62 | 0.8820 |
| | 14 0.7874 | 22.15 | 1.477 | 330 45 | 22 3.0 | 66 41 | 4 26.7 | 1.0440 | 1.2786 | 7.57 | 0.8791 |
| | 15 0.7901 | 22.19 | 1.479 | 330 48 | 22 3.2 | 65 38 | 4 22.5 | 1.0445 | 1.2791 | 7.52 | 0.8760 |
| | 16 0.7929 | +22.23 | +1.482 | 330 57 | 22 3.8 | 64 35 | 4 18.3 | +1.0448 | +1.2796 | +7.46 | +0.8728 |
| | 17 0.7956 | 22.29 | 1.486 | 331 11 | 22 4.7 | 63 32 | 4 14.1 | 1.0449 | 1.2801 | 7.40 | 0.8694 |
| | 18 0.7983 | 22.39 | 1.493 | 331 29 | 22 5.9 | 62 29 | 4 9.9 | 1.0456 | 1.2806 | 7.34 | 0.8658 |
| | 19 0.8011 | 22.52 | 1.501 | 331 51 | 22 7.4 | 61 26 | 4 5.7 | 1.0467 | 1.2812 | 7.28 | 0.8621 |
| | 20 0.8038 | 22.69 | 1.513 | 332 13 | 22 8.9 | 60 23 | 4 1.5 | 1.0484 | 1.2817 | 7.22 | 0.8582 |
| | ϵ 21 0.8066 | +22.88 | +1.525 | 332 32 | 22 10.1 | 59 20 | 3 57.3 | +1.0508 | +1.2823 | +7.15 | +0.8542 |
| | (2.0) 22 0.8093 | 23.09 | 1.539 | 332 48 | 22 11.2 | 58 18 | 3 53.2 | 1.0536 | 1.2828 | 7.08 | 0.8501 |
| | 23 0.8120 | 23.27 | 1.551 | 332 57 | 22 11.8 | 57 16 | 3 49.1 | 1.0565 | 1.2834 | 7.01 | 0.8458 |
| | 24 0.8148 | 23.43 | 1.562 | 333 1 | 22 12.1 | 56 14 | 3 44.9 | 1.0593 | 1.2840 | 6.94 | 0.8413 |
| | 25 0.8175 | 23.56 | 1.571 | 333 1 | 22 12.1 | 55 12 | 3 40.8 | 1.0617 | 1.2846 | 6.87 | 0.8366 |
| | 26 0.8203 | +23.65 | +1.577 | 332 58 | 22 11.9 | 54 10 | 3 36.7 | +1.0634 | +1.2852 | +6.79 | +0.8317 |
| | 27 0.8230 | 23.70 | 1.580 | 332 56 | 22 11.7 | 53 8 | 3 32.5 | 1.0645 | 1.2858 | 6.71 | 0.8265 |
| | 28 0.8257 | 23.73 | 1.582 | 332 56 | 22 11.7 | 52 6 | 3 28.4 | 1.0650 | 1.2864 | 6.63 | 0.8212 |
| | 29 0.8285 | 23.76 | 1.584 | 333 1 | 22 12.1 | 51 5 | 3 24.3 | 1.0652 | 1.2871 | 6.55 | 0.8157 |
| | 30 0.8312 | 23.79 | 1.586 | 333 12 | 22 12.8 | 50 4 | 3 20.3 | 1.0652 | 1.2877 | 6.46 | 0.8100 |
| Nov. | 31 0.8340 | +23.86 | +1.591 | 333 27 | 22 13.8 | 49 3 | 3 16.2 | +1.0653 | +1.2884 | +6.37 | +0.8041 |
| | 1 0.8367 | 23.96 | 1.597 | 333 47 | 22 15.1 | 48 2 | 3 12.1 | 1.0659 | 1.2891 | 6.28 | 0.7979 |
| | 2 0.8394 | 24.10 | 1.607 | 334 9 | 22 16.6 | 47 2 | 3 8.1 | 1.0672 | 1.2898 | 6.19 | 0.7915 |
| | 3 0.8421 | 24.29 | 1.619 | 334 30 | 22 18.0 | 46 1 | 3 4.1 | 1.0692 | 1.2904 | 6.10 | 0.7848 |
| | 4 0.8449 | 24.50 | 1.633 | 334 48 | 22 19.2 | 45 1 | 3 0.1 | 1.0719 | 1.2911 | 6.00 | 0.7779 |
| | ζ 5 0.8476 | +24.72 | +1.648 | 335 1 | 22 20.1 | 44 0 | 2 56.0 | +1.0751 | +1.2917 | +5.90 | +0.7708 |
| | (3.0) 6 0.8503 | 24.93 | 1.662 | 335 10 | 22 20.7 | 43 0 | 2 52.0 | 1.0782 | 1.2924 | 5.80 | 0.7635 |
| | 7 0.8530 | 25.12 | 1.675 | 335 13 | 22 20.9 | 42 0 | 2 48.0 | 1.0811 | 1.2930 | 5.70 | 0.7559 |
| | 8 0.8558 | 25.27 | 1.685 | 335 14 | 22 20.9 | 41 0 | 2 44.0 | 1.0837 | 1.2937 | 5.60 | 0.7480 |
| | 9 0.8585 | 25.39 | 1.693 | 335 14 | 22 20.9 | 40 1 | 2 40.1 | 1.0857 | 1.2944 | 5.50 | 0.7398 |
| | 10 0.8613 | +25.47 | +1.698 | 335 15 | 22 21.0 | 39 1 | 2 36.1 | +1.0870 | +1.2950 | +5.39 | +0.7313 |
| | 11 0.8640 | 25.54 | 1.703 | 335 19 | 22 21.3 | 38 1 | 2 32.1 | 1.0881 | 1.2956 | 5.28 | 0.7225 |
| | 12 0.8667 | 25.61 | 1.707 | 335 28 | 22 21.9 | 37 2 | 2 28.1 | 1.0889 | 1.2963 | 5.17 | 0.7133 |
| | 13 0.8695 | 25.70 | 1.713 | 335 42 | 22 22.8 | 36 2 | 2 24.1 | 1.0896 | 1.2969 | 5.06 | 0.7038 |
| | 14 0.8722 | 25.83 | 1.722 | 336 1 | 22 24.1 | 35 3 | 2 20.2 | 1.0906 | 1.2975 | 4.95 | 0.6940 |
| | 15 0.8750 | +25.99 | +1.733 | 336 22 | 22 25.5 | 34 4 | 2 16.3 | +1.0921 | +1.2981 | +4.83 | +0.6839 |
| | 16 0.8777 | +26.18 | +1.745 | 336 43 | 22 26.9 | 33 5 | 2 12.3 | +1.0942 | +1.2987 | +4.71 | +0.6734 |

FOR WASHINGTON MEAN MIDNIGHT.

| Solar Day. (Std. Hour.) | τ | f | | G | | H | | Log g . | Log h . | i | Log i . | | |
|----------------------------|-----------------------|---------|----------|---------|----------|---------|----------|-----------|-----------|---------|-----------|---------|---------|
| | | In Arc. | In Time. | In Arc. | In Time. | In Arc. | In Time. | | | | | | |
| Nov. | ^y 16 | 0.8777 | +26.18 | +1.745 | 336 43 | 22 26.9 | 33 5 | 2 12.3 | +1.0942 | +1.2987 | +4.71 | +0.6734 | |
| | 17 | 0.8804 | 26.41 | 1.761 | 337 3 | 22 28.2 | 32 6 | 2 8.4 | 1.0969 | 1.2993 | 4.59 | 0.6625 | |
| | 18 | 0.8832 | 26.66 | 1.777 | 337 18 | 22 29.2 | 31 8 | 2 4.5 | 1.1000 | 1.2999 | 4.47 | 0.6511 | |
| | 19 | 0.8859 | 26.89 | 1.793 | 337 29 | 22 29.9 | 30 10 | 2 0.7 | 1.1031 | 1.3005 | 4.35 | 0.6392 | |
| | 20 | 0.8887 | 27.09 | 1.806 | 337 34 | 22 30.3 | 29 12 | 1 56.8 | 1.1063 | 1.3011 | 4.23 | 0.6268 | |
| | ^b (4.0) | 21 | 0.8914 | +27.27 | +1.818 | 337 35 | 22 30.3 | 28 14 | 1 52.9 | +1.1090 | +1.3016 | +4.11 | +0.6140 |
| | 22 | 0.8941 | 27.41 | 1.827 | 337 33 | 22 30.2 | 27 16 | 1 49.1 | 1.1113 | 1.3022 | 3.99 | 0.6008 | |
| | 23 | 0.8969 | 27.51 | 1.834 | 337 32 | 22 30.1 | 26 18 | 1 45.2 | 1.1131 | 1.3027 | 3.87 | 0.5869 | |
| | 24 | 0.8996 | 27.59 | 1.839 | 337 32 | 22 30.1 | 25 20 | 1 41.3 | 1.1142 | 1.3032 | 3.74 | 0.5723 | |
| | 25 | 0.9024 | 27.65 | 1.843 | 337 36 | 22 30.4 | 24 23 | 1 37.5 | 1.1150 | 1.3037 | 3.61 | 0.5570 | |
| | 26 | 0.9051 | +27.71 | +1.847 | 337 45 | 22 31.0 | 23 26 | 1 33.7 | +1.1155 | +1.3042 | +3.48 | +0.5411 | |
| | 27 | 0.9078 | 27.80 | 1.853 | 337 59 | 22 31.9 | 22 28 | 1 29.9 | 1.1163 | 1.3047 | 3.35 | 0.5245 | |
| | 28 | 0.9106 | 27.94 | 1.863 | 338 15 | 22 33.0 | 21 31 | 1 26.1 | 1.1175 | 1.3052 | 3.22 | 0.5071 | |
| | 29 | 0.9133 | 28.11 | 1.874 | 338 34 | 22 34.3 | 20 34 | 1 22.3 | 1.1192 | 1.3056 | 3.09 | 0.4888 | |
| | 30 | 0.9161 | 28.32 | 1.888 | 338 52 | 22 35.5 | 19 37 | 1 18.5 | 1.1216 | 1.3060 | 2.95 | 0.4695 | |
| | Dec. | 1 | 0.9188 | +28.56 | +1.904 | 339 7 | 22 36.5 | 18 40 | 1 14.7 | +1.1244 | +1.3064 | +2.81 | +0.4492 |
| | | 2 | 0.9215 | 28.81 | 1.921 | 339 19 | 22 37.3 | 17 43 | 1 10.9 | 1.1276 | 1.3068 | 2.68 | 0.4277 |
| | | 3 | 0.9243 | 29.06 | 1.937 | 339 26 | 22 37.7 | 16 46 | 1 7.1 | 1.1311 | 1.3071 | 2.54 | 0.4050 |
| | | 4 | 0.9270 | 29.28 | 1.952 | 339 28 | 22 37.9 | 15 49 | 1 3.3 | 1.1344 | 1.3075 | 2.40 | 0.3808 |
| | | 5 | 0.9298 | 29.48 | 1.965 | 339 27 | 22 37.8 | 14 52 | 0 59.5 | 1.1373 | 1.3078 | 2.26 | 0.3549 |
| ^b (5.0) | 6 | 0.9325 | +29.64 | +1.976 | 339 25 | 22 37.7 | 13 56 | 0 55.7 | +1.1397 | +1.3082 | +2.12 | +0.3274 | |
| | 7 | 0.9352 | 29.78 | 1.985 | 339 23 | 22 37.5 | 12 59 | 0 51.9 | 1.1416 | 1.3085 | 1.98 | 0.2979 | |
| | 8 | 0.9380 | 29.87 | 1.991 | 339 24 | 22 37.6 | 12 2 | 0 48.1 | 1.1432 | 1.3088 | 1.84 | 0.2660 | |
| | 9 | 0.9407 | 29.98 | 1.999 | 339 29 | 22 37.9 | 11 6 | 0 44.4 | 1.1445 | 1.3091 | 1.70 | 0.2315 | |
| | 10 | 0.9435 | 30.10 | 2.007 | 339 38 | 22 38.5 | 10 10 | 0 40.7 | 1.1457 | 1.3094 | 1.56 | 0.1939 | |
| | 11 | 0.9462 | +30.24 | +2.016 | 339 51 | 22 39.4 | 9 14 | 0 36.9 | +1.1471 | +1.3096 | +1.42 | +0.1524 | |
| | 12 | 0.9489 | 30.42 | 2.028 | 340 7 | 22 40.5 | 8 17 | 0 33.1 | 1.1490 | 1.3098 | 1.28 | 0.1065 | |
| | 13 | 0.9517 | 30.63 | 2.042 | 340 23 | 22 41.5 | 7 21 | 0 29.4 | 1.1513 | 1.3100 | 1.14 | 0.0549 | |
| | 14 | 0.9544 | 30.87 | 2.058 | 340 37 | 22 42.5 | 6 25 | 0 25.7 | 1.1540 | 1.3101 | 0.99 | 0.9961 | |
| | 15 | 0.9572 | 31.14 | 2.076 | 340 49 | 22 43.3 | 5 29 | 0 21.9 | 1.1572 | 1.3102 | 0.85 | 9.9279 | |
| | 16 | 0.9599 | +31.41 | +2.094 | 340 56 | 22 43.7 | 4 33 | 0 18.2 | +1.1606 | +1.3103 | +0.70 | +9.8468 | |
| | 17 | 0.9626 | 31.64 | 2.109 | 340 58 | 22 43.9 | 3 37 | 0 14.5 | 1.1639 | 1.3104 | 0.56 | 9.7465 | |
| | 18 | 0.9654 | 31.86 | 2.124 | 340 57 | 22 43.8 | 2 41 | 0 10.7 | 1.1669 | 1.3105 | 0.41 | 9.6150 | |
| | 19 | 0.9681 | 32.03 | 2.135 | 340 52 | 22 43.5 | 1 45 | 0 7.0 | 1.1694 | 1.3105 | 0.27 | 9.4221 | |
| | 20 | 0.9709 | 32.16 | 2.144 | 340 47 | 22 43.1 | 0 49 | 0 3.3 | 1.1713 | 1.3106 | +0.12 | +9.1055 | |
| | ^b (6.0) | 21 | 0.9736 | +32.26 | +2.151 | 340 43 | 22 42.9 | 359 53 | 23 59.5 | +1.1728 | +1.3106 | -0.02 | -8.1847 |
| | | 22 | 0.9763 | 32.34 | 2.156 | 340 42 | 22 42.8 | 358 57 | 23 55.8 | 1.1740 | 1.3106 | 0.17 | 9.1889 |
| | | 23 | 0.9790 | 32.42 | 2.161 | 340 45 | 22 43.0 | 358 1 | 23 52.1 | 1.1750 | 1.3105 | 0.32 | 9.4803 |
| | | 24 | 0.9818 | 32.53 | 2.169 | 340 52 | 22 43.5 | 357 5 | 23 48.3 | 1.1761 | 1.3105 | 0.46 | 9.6513 |
| | | 25 | 0.9845 | 32.66 | 2.177 | 341 2 | 22 44.1 | 356 9 | 23 44.6 | 1.1773 | 1.3104 | 0.60 | 9.7732 |
| 26 | | 0.9872 | +32.82 | +2.188 | 341 14 | 22 44.9 | 355 12 | 23 40.8 | +1.1790 | +1.3103 | -0.74 | -9.8680 | |
| 27 | | 0.9899 | 33.04 | 2.203 | 341 26 | 22 45.7 | 354 16 | 23 37.1 | 1.1813 | 1.3102 | 0.89 | 9.9455 | |
| 28 | | 0.9927 | 33.28 | 2.219 | 341 36 | 22 46.4 | 353 20 | 23 33.3 | 1.1840 | 1.3100 | 1.03 | 0.0112 | |
| 29 | | 0.9954 | 33.53 | 2.235 | 341 43 | 22 46.9 | 352 24 | 23 29.6 | 1.1871 | 1.3099 | 1.18 | 0.0682 | |
| 30 | | 0.9982 | 33.79 | 2.253 | 341 46 | 22 47.1 | 351 28 | 23 25.9 | 1.1903 | 1.3097 | 1.32 | 0.1183 | |
| | 31 | 1.0009 | +34.03 | +2.269 | 341 44 | 22 46.9 | 350 31 | 23 22.1 | +1.1935 | +1.3095 | -1.46 | -0.1631 | |
| | 32 | 1.0036 | +34.25 | +2.283 | 341 40 | 22 46.7 | 349 35 | 23 18.3 | +1.1963 | +1.3093 | -1.60 | -0.2036 | |

MEAN PLACES FOR 1891.0. (January 0^d.0—0^d.078, Washington.)

| Name of Star. | Magni- tude. | Right Ascension. | Annual Variation. | Declination. | Annual Variation. |
|--|-----------------|--|----------------------|--|----------------------|
| | | ^h ^m ^s | ^s | ^o ['] ["] | ["] |
| <i>a</i> Andromedæ | 2.1 | 0 2 45.208 | + 3.0917 | + 28 29 18.96 | + 19.884 |
| * <i>β</i> Cassiopææ | 2.4 | 0 3 21.770 | 3.1749 | + 58 32 53.66 | 19.851 |
| * 22 Andromedæ | 4.9 | 0 4 39.382 | 3.1028 | + 45 27 55.73 | 20.035 |
| 4 Draconis (H.) . . S. P. | 5.1 | 0 7 5.675 | 2.8840 | + 101 46 41.04 | 20.022 |
| <i>γ</i> Pegasi (<i>Algenib</i>) . . . | 2.8 | 0 7 37.372 | 3.0839 | + 14 34 39.07 | 20.023 |
| * <i>σ</i> Andromedæ | 4.4 | 0 12 38.042 | + 3.1234 | + 36 10 50.93 | + 19.982 |
| * <i>ε</i> Ceti | 3.6 | 0 13 52.251 | 3.0528 | — 9 25 42.55 | 19.956 |
| * 6 Ursæ Minoris . . S. P. | 6.2 | 0 14 20.556 | 0.1710 | + 91 41 44.51 | 19.940 |
| * 44 Piscium | 5.8 | 0 19 48.882 | 3.0732 | + 1 20 9.63 | 19.953 |
| <i>β</i> Hydri | 2.8 | 0 20 0.775 | 3.2289 | — 77 52 5.51 | 20.283 |
| 13 Ceti | 6.0 | 0 24 28.550 | + 3.0611 | — 4 33 34.53 | + 19.937 |
| * <i>κ</i> Draconis S. P. | 3.8 | 0 28 49.816 | 2.5910 | + 109 36 39.45 | 19.889 |
| * <i>π</i> Andromedæ | 4.4 | 0 31 3.527 | 3.1910 | + 33 7 9.02 | 19.870 |
| <i>α</i> Cassiopææ (<i>var.</i>) . . . | 2.3 | 0 34 19.425 | 3.3746 | + 55 56 21.82 | 19.787 |
| <i>β</i> Ceti | 2.2 | 0 38 7.106 | 3.0142 | — 18 35 6.32 | 19.801 |
| 21 Cassiopææ | 5.7 | 0 38 27.080 | + 3.8601 | + 74 23 31.82 | + 19.751 |
| * <i>ο</i> Cassiopææ | 4.7 | 0 38 39.064 | 3.3198 | + 47 41 15.50 | 19.754 |
| * <i>δ</i> Piscium | 4.8 | 0 43 1.596 | 3.1075 | + 6 59 30.26 | 19.652 |
| 32 ^a Camelop. (H.) . . S. P. | 5.2 | 0 48 19.853 | 0.3961 | + 95 59 40.83 | 19.596 |
| * <i>γ</i> Cassiopææ | 2.3 | 0 50 7.860 | 3.5801 | + 60 7 34.52 | 19.562 |
| * <i>μ</i> Andromedæ | 4.0 | 0 50 42.167 | + 3.3116 | + 37 54 29.11 | + 19.616 |
| * 43 Cephei (H.) | 4.6 | 0 53 55.448 | 7.2565 | + 85 40 19.52 | 19.500 |
| <i>ε</i> Piscium | 4.3 | 0 57 17.148 | 3.1092 | + 7 18 11.33 | 19.453 |
| <i>β</i> Andromedæ | 2.2 | 1 3 37.770 | 3.3447 | + 35 2 32.88 | 19.163 |
| * <i>κ</i> Tucanæ | 4.9 | 1 12 4.466 | 2.0549 | — 69 27 17.98 | 19.169 |
| * <i>f</i> Piscium | 5.1 | 1 12 10.551 | + 3.0898 | + 3 2 25.13 | + 19.037 |
| <i>θ</i> ¹ Ceti | 3.6 | 1 18 34.486 | 2.9971 | — 8 44 45.49 | 18.666 |
| <i>α</i> Ursæ Minoris (<i>Polaris</i>) | 2.2 | 1 18 54.555 | 23.5100 | + 88 43 37.28 | 18.876 |
| 38 Cassiopææ | 5.9 | 1 23 7.308 | 4.3800 | + 69 42 11.95 | 18.673 |
| * <i>κ</i> Octantis S. P. | 5.4 | 1 23 24.392 | 8.7687 | — 94 46 23.64 | 18.741 |
| <i>η</i> Piscium | 3.7 | 1 25 39.027 | + 3.2028 | + 14 47 1.46 | + 18.661 |
| * <i>υ</i> Andromedæ | 4.2 | 1 30 24.030 | 3.5049 | + 40 51 36.71 | 18.143 |
| * <i>π</i> Piscium | 5.5 | 1 31 19.214 | 3.1743 | + 11 35 2.15 | 18.530 |
| <i>α</i> Eridani (<i>Achernar</i>) . . | 0.4 | 1 33 38.927 | 2.2322 | — 57 47 26.46 | 18.355 |
| * <i>ν</i> Piscium | 4.6 | 1 35 45.526 | 3.1180 | + 4 56 8.93 | 18.327 |
| <i>ο</i> Piscium | 4.4 | 1 39 38.258 | + 3.1624 | + 8 36 31.49 | + 18.214 |
| * <i>ζ</i> Ceti | 3.6 | 1 46 4.809 | 2.9618 | — 10 52 29.12 | 17.820 |
| <i>β</i> Arietis | 2.8 | 1 48 37.093 | 3.3038 | + 20 16 29.82 | 17.725 |
| 50 Cassiopææ | 4.1 | 1 54 7.855 | 5.0140 | + 71 53 36.55 | 17.641 |
| * <i>γ</i> Andromedæ | 2.2 | 1 57 12.508 | 3.6610 | + 41 48 22.85 | 17.439 |
| <i>α</i> Arietis | 2.1 | 2 1 1.718 | + 3.3713 | + 22 56 48.21 | + 17.170 |
| <i>α</i> Draconis S. P. | 3.7 | 2 1 26.354 | 1.6238 | + 115 6 11.59 | 17.297 |
| * <i>β</i> Trianguli | 3.1 | 2 3 3.485 | 3.5550 | + 34 28 17.06 | 17.200 |
| <i>ξ</i> ¹ Ceti | 4.5 | 2 7 13.361 | + 3.1742 | + 8 20 6.29 | 17.027 |
| * 4 Ursæ Minoris . . S. P. | 4.9 | 2 9 16.701 | — 0.3203 | + 101 56 24.86 | 16.906 |
| * <i>γ</i> Trianguli | 4.3 | 2 10 50.058 | + 3.5514 | + 33 20 34.04 | + 16.841 |
| * 67 Ceti | 5.6 | 2 11 32.759 | 2.9894 | — 6 55 29.43 | 16.730 |
| * <i>δ</i> Hydri | 4.2 | 2 19 48.670 | 1.0552 | — 69 9 19.50 | 16.449 |
| <i>ε</i> Cassiopææ | 4.6 | 2 20 5.014 | 4.8643 | + 66 54 42.63 | 16.427 |
| <i>ξ</i> ² Ceti | 4.5 | 2 22 21.822 | + 3.1839 | + 7 58 16.03 | + 16.291 |

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1891.0. (January 0^d.0—0^d.078, Washington.)

| Name of Star. | Magni- tude. | Right Ascension. | Annual Variation. | Declination. | Annual Variation. |
|---|-----------------|--|----------------------|------------------|----------------------|
| 5 Ursæ Minoris . . . S. P. | 4.5 | ^h 2 ^m 27 ^s 45.610 | — 0.1884 | + 103° 49' 10.16 | + 16.012 |
| * δ Ceti | 4.1 | 2 33 53.742 | + 3.0729 | — 0 8 31.95 | 15.693 |
| * μ Hydri | 5.3 | 2 33 59.107 | — 1.4313 | — 79 35 4.56 | 15.683 |
| * θ Persei | 4.2 | 2 36 45.339 | + 4.0706 | + 48 46 0.88 | 15.452 |
| γ Ceti | 3.6 | 2 37 39.129 | 3.1034 | + 2 46 33.90 | 15.335 |
| * σ Arietis | 5.5 | 2 45 28.465 | + 3.3047 | + 14 37 56.94 | + 15.009 |
| β Ursæ Minoris . . . S. P. | 2.2 | 2 51 1.596 | — 0.2294 | + 105 23 56.67 | 14.719 |
| * 47 Cephei (H.) . . . | 5.7 | 2 51 30.556 | + 7.7289 | + 78 59 12.88 | 14.684 |
| * ε Arietis | 4.6 | 2 52 58.750 | 3.4213 | + 20 54 14.71 | 14.606 |
| α Ceti | 2.6 | 2 56 34.869 | 3.1305 | + 3 39 42.16 | 14.304 |
| * β Persei (Algol) (var.) | 2.3 | 3 1 4.579 | + 3.8842 | + 40 32 6.43 | + 14.114 |
| 48 Cephei (H.) . . . | 5.5 | 3 6 30.109 | 7.4125 | + 77 19 59.70 | 13.719 |
| ζ Arietis | 4.8 | 3 8 38.154 | 3.4396 | + 20 38 24.15 | 13.551 |
| α Persei | 1.9 | 3 16 32.519 | 4.2583 | + 49 28 21.42 | 13.086 |
| * ρ Octantis S. P. | 5.7 | 3 18 13.867 | + 12.9997 | — 95 53 59.94 | 12.964 |
| * ι Hydri | 5.7 | 3 18 41.072 | — 1.5953 | — 77 47 10.39 | + 13.029 |
| γ ² Ursæ Minoris . . . S. P. | 3.2 | 3 20 54.278 | — 0.1325 | + 107 46 41.35 | 12.811 |
| * f Tauri | 4.3 | 3 24 51.270 | + 3.3051 | + 12 33 45.96 | 12.564 |
| * ε Eridani | 3.7 | 3 27 47.684 | 2.8237 | — 9 49 38.61 | 12.389 |
| δ Persei | 3.1 | 3 35 9 901 | 4.2506 | + 47 26 17.98 | 11.803 |
| * γ Camelopardalis (H.) | 4.6 | 3 38 51.361 | + 6.2409 | + 70 59 43.56 | + 11.534 |
| η Tauri | 3.1 | 3 41 0.267 | 3.5571 | + 23 46 3.05 | 11.374 |
| ζ Persei | 3.0 | 3 47 16.814 | + 3.7605 | + 31 33 33.24 | 10.943 |
| ζ Ursæ Minoris . . . S. P. | 4.6 | 3 47 57.692 | — 2.2483 | + 101 52 13.69 | 10.925 |
| * γ Hydri | 3.3 | 3 48 55.759 | — 0.9950 | — 74 34 22.26 | 10.983 |
| * ε Persei | 3.0 | 3 50 32.301 | + 4.0104 | + 39 41 39.27 | + 10.715 |
| γ Eridani | 3.0 | 3 52 56.669 | 2.7986 | — 13 49 8.50 | 10.441 |
| * A ¹ Tauri | 4.6 | 3 58 15.076 | 3.5402 | + 21 46 59.96 | 10.078 |
| * c Persei | 4.3 | 4 0 44.907 | 4.3377 | + 47 25 14.69 | 9.932 |
| Groombr. 2320 . . . S. P. | 5.5 | 4 6 1.323 | 0.1404 | + 111 54 9.36 | 9.498 |
| * σ ¹ Eridani | 4.2 | 4 6 32.678 | + 2.9268 | — 7 7 20.39 | + 9.611 |
| γ Tauri | 3.8 | 4 13 35.418 | + 3.4091 | + 15 21 50.03 | 8.952 |
| * η Ursæ Minoris . . . S. P. | 5.0 | 4 20 41.658 | — 1.8147 | + 103 59 37.19 | 8.165 |
| ε Tauri | 3.6 | 4 22 15.086 | + 3.4976 | + 18 56 17.06 | 8.251 |
| η Draconis S. P. | 2.0 | 4 22 31.062 | + 0.8066 | + 118 14 20.55 | 8.220 |
| * δ Mensæ | 5.6 | 4 25 21.707 | — 4.2195 | — 80 28 9.21 | + 8.053 |
| * m Persei | 6.0 | 4 25 44.758 | + 4.2105 | + 42 49 48.82 | 7.997 |
| A Draconis S. P. | 5.0 | 4 28 12.041 | — 0.1343 | + 110 59 46.47 | 7.798 |
| α Tauri (Aldebaran) . | 1.0 | 4 29 39.952 | + 3.4376 | + 16 17 22.53 | 7.509 |
| * τ Tauri | 4.5 | 4 35 42.153 | 3.5955 | + 22 44 49.84 | 7.184 |
| α Camelopardalis . . | 4.4 | 4 43 12.742 | + 5.9261 | + 66 9 23.25 | + 6.592 |
| * i Tauri | 5.2 | 4 44 59.851 | 3.5055 | + 18 39 13.15 | 6.400 |
| ι Aurigæ | 2.8 | 4 49 53.716 | 3.9008 | + 32 59 34.26 | 6.017 |
| * ε Aurigæ | 3.9 | 4 54 51.528 | + 4.1853 | + 40 54 57.69 | 5.617 |
| ε Ursæ Minoris . . . S. P. | 4.5 | 4 57 9.282 | — 6.3266 | + 97 47 3.30 | 5.433 |
| 11 Orionis | 4.7 | 4 58 20.403 | + 3.4245 | + 15 15 5.98 | + 5.291 |
| * β Eridani | 2.9 | 5 2 29.463 | 2.9486 | — 5 13 40.13 | 4.921 |
| α Aurigæ (Capella) . . | 0.1 | 5 8 38.215 | 4.4250 | + 45 53 10.72 | 4.022 |
| β Orionis (Rigel) . . | 0.3 | 5 9 17.959 | 2.8814 | — 8 19 41.13 | 4.394 |
| * τ Orionis | 3.8 | 5 12 18.819 | + 2.9127 | — 6 57 46.30 | + 4.131 |

Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1891.0. (January 0^d.0–0^d.078, Washington.)

| Name of Star. | Magni- tude. | Right Ascension. | Annual Variation. | Declination. | Annual Variation. |
|--|-----------------|--|----------------------|--|----------------------|
| | | ^h ^m ^s | ^s | [°] ['] ["] | ["] |
| β Tauri | 1.8 | 5 19 24.085 | + 3.7894 | + 28 30' 52.84 | + 3.353 |
| Groombridge 966 | 6.4 | 5 25 9.557 | 8.0018 | + 74 58 12.78 | 3.056 |
| χ Aurigæ | 5.0 | 5 25 38.083 | 3.9051 | + 32 6 39.74 | 3.016 |
| δ Orionis (<i>var.</i>) | 2.3 | 5 26 26.273 | 3.0635 | — 0 22 49.40 | 2.921 |
| * Groombridge 944 | 6.4 | 5 27 7.005 | 18.6614 | + 85 8 25.43 | 2.880 |
| α Leporis | 2.7 | 5 27 55.363 | + 2.6448 | — 17 54 2.82 | + 2.797 |
| ϵ Orionis | 1.8 | 5 30 40.936 | 3.0424 | — 1 16 19.44 | 2.559 |
| α Columbæ | 2.7 | 5 35 42.185 | + 2.1728 | — 34 7 57.59 | 2.077 |
| ω Draconis S. P. | 4.9 | 5 37 35.449 | — 0.3566 | + 111 11 30.33 | 1.634 |
| * κ Orionis | 2.3 | 5 42 35.185 | + 2.8449 | — 9 42 31.93 | 1.525 |
| ϕ^1 Draconis S. P. | 4.8 | 5 43 52.599 | — 1.0788 | + 107 47 52.48 | + 1.683 |
| * ν Aurigæ | 4.1 | 5 43 56.073 | + 4.1544 | + 39 6 56.92 | 1.441 |
| * δ Doradus | 4.4 | 5 44 34.859 | 0.1049 | — 65 46 34.88 | 1.328 |
| α Orionis (<i>var.</i>) | 0.9 | 5 49 16.232 | 3.2470 | + 7 23 10.08 | 0.946 |
| * β Aurigæ | 2.0 | 5 51 32.013 | 4.4017 | + 44 56 7.71 | 0.730 |
| * θ Aurigæ | 2.9 | 5 52 17.348 | + 4.0920 | + 37 12 15.24 | + 0.586 |
| ν Orionis | 4.5 | 6 1 20.971 | 3.4274 | + 14 46 51.00 | — 0.148 |
| 22 Camelopardalis (H.) | 4.7 | 6 6 49.820 | + 6.6172 | + 69 21 24.87 | 0.716 |
| δ Ursæ Minoris S. P. | 4.4 | 6 7 28.173 | — 19.4690 | + 93 23 17.52 | 0.704 |
| * η Geminorum | 3.5 | 6 8 17.922 | + 3.6228 | + 22 32 16.00 | 0.742 |
| μ Geminorum | 3.2 | 6 16 22.005 | + 3.6314 | + 22 34 7.75 | — 1.552 |
| * ϕ^1 Aurigæ | 5.1 | 6 16 30.243 | 4.6264 | + 49 20 33.65 | 1.454 |
| α Argus (<i>Canopus</i>) | — 0.8 | 6 21 32.017 | 1.3305 | — 52 38 10.55 | 1.872 |
| * ν Geminorum | 4.2 | 6 22 29.453 | + 3.5630 | + 20 16 49.65 | 1.967 |
| * χ Draconis S. P. | 5.3 | 6 23 1.256 | — 1.0797 | + 107 18 52.89 | 1.635 |
| γ Geminorum | 2.0 | 6 31 24.909 | + 3.4673 | + 16 29 30.12 | — 2.788 |
| * ϵ Geminorum | 3.2 | 6 37 13.540 | 3.6933 | + 25 14 18.32 | 3.257 |
| * ϕ^5 Aurigæ | 5.4 | 6 38 52.905 | 4.3288 | + 43 41 6.50 | 3.238 |
| † α Canis Majoris (<i>Sirius</i>) | — 1.4 | 6 40 20.702 | 2.6436 | — 16 34 1.44 | 4.719 |
| * θ Geminorum | 3.7 | 6 45 36.332 | + 3.9604 | + 34 5 31.56 | 3.996 |
| * ζ Mensæ | 5.6 | 6 49 6.657 | — 4.9045 | — 80 41 53.62 | — 4.183 |
| 51 Cephei (H.) | 5.3 | 6 49 15.172 | + 20.8670 | + 87 13 0.78 | 4.314 |
| 50 Draconis S. P. | 5.6 | 6 49 53.149 | — 1.9088 | + 104 41 41.50 | 4.405 |
| ϵ Canis Majoris | 1.5 | 6 54 20.547 | + 2.3577 | — 28 49 27.28 | 4.723 |
| * ζ Geminorum (<i>var.</i>) | 4.0 | 6 57 38.685 | 3.5623 | + 20 43 46.20 | 5.009 |
| δ Canis Majoris | 1.9 | 7 3 57.554 | + 2.4385 | — 26 13 13.60 | — 5.514 |
| * 68 Aurigæ | 5.2 | 7 4 9.500 | 4.1363 | + 39 29 52.11 | 5.522 |
| * 25 Camelopardalis | 5.3 | 7 8 7.605 | + 12.9513 | + 82 37 10.54 | 5.905 |
| * γ^2 Volantis (<i>var.</i>) | 3.9 | 7 9 40.094 | — 0.4941 | — 70 19 19.88 | 6.003 |
| δ Draconis S. P. | 3.1 | 7 12 31.768 | + 0.0292 | + 112 31 48.73 | 6.326 |
| δ Geminorum | 3.5 | 7 13 36.808 | + 3.5878 | + 22 10 56.68 | — 6.346 |
| τ Draconis S. P. | 4.5 | 7 17 38.903 | — 1.1179 | + 106 50 49.37 | 6.773 |
| Piazzi vii. 67 | 5.7 | 7 19 32.287 | + 6.2973 | + 68 41 14.48 | 6.858 |
| * β Canis Minoris | 3.1 | 7 21 14.414 | 3.2596 | + 8 30 30.08 | 6.998 |
| α^2 Geminorum (<i>Castor</i>) | 1.9 | 7 27 38.771 | + 3.8382 | + 32 7 37.59 | 7.560 |
| λ Ursæ Minoris S. P. | 6.5 | 7 32 29.969 | — 65.3160 | + 91 1 51.52 | — 7.884 |
| † α Canis Min. (<i>Procyon</i>) | 0.5 | 7 33 35.765 | + 3.1434 | + 5 30 13.76 | 9.000 |
| β Geminorum (<i>Pollux</i>) | 1.2 | 7 38 38.776 | 3.6790 | + 28 17 20.03 | 8.424 |
| * 26 Lyncis | 5.8 | 7 46 46.487 | 4.3877 | + 47 50 46.96 | 9.028 |
| φ Geminorum | 5.0 | 7 46 49.604 | + 3.6797 | + 27 2 50.76 | — 9.036 |

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

† Periodic corrections given in the Appendix are still to be applied to the positions of Sirius and Procyon.

| MEAN PLACES FOR 1891.0. (January 0 ^d .0—0 ^d .078, Washington.) | | | | | | |
|--|-----------------|------------------|--------------|--------------|----------------------|----------------|
| Name of Star. | Magni- tude. | Right Ascension. | | | Annual Variation. | Declination. |
| | | ^h | ^m | ^s | ^s | [°] |
| * Groombridge 1374 | 5.6 | 7 | 47 | 8.280 | + 7.2830 | + 74 12 28.70 |
| ε Draconis S. P. | 3.9 | 7 | 48 | 32.275 | — 0.1790 | + 110 0 34.82 |
| * ω ¹ Cancri | 6.0 | 7 | 54 | 20.188 | + 3.6371 | + 25 41 26.82 |
| 3 Ursæ Majoris (H.) | 5.5 | 8 | 1 | 57.880 | 6.0471 | + 68 47 38.40 |
| 15 Argûs (ρ) | 3.1 | 8 | 2 | 54.124 | 2.5545 | — 23 59 25.51 |
| * ζ ¹ Cancri | 4.8 | 8 | 5 | 57.644 | + 3.4463 | + 17 58 31.53 |
| * β Cancri | 3.8 | 8 | 10 | 36.239 | + 3.2584 | + 9 31 15.21 |
| * κ Cephei (<i>pr.</i>) S. P. | 4.4 | 8 | 12 | 33.033 | — 1.9257 | + 102 37 1.42 |
| * 30 Monocerotis | 3.9 | 8 | 20 | 12.822 | + 3.0000 | — 3 33 4.24 |
| * θ Chamæleontis | 4.6 | 8 | 23 | 53.906 | — 1.7129 | — 77 7 57.25 |
| η Cancri | 5.4 | 8 | 26 | 24.372 | + 3.4781 | + 20 48 39.46 |
| Groombr. 3241 S. P. | 6.5 | 8 | 30 | 28.440 | — 0.2209 | + 107 50 15.44 |
| * σ Hydræ | 4.5 | 8 | 33 | 3.733 | + 3.1458 | + 3 43 25.16 |
| * γ Cancri | 4.9 | 8 | 36 | 58.712 | 3.4802 | + 21 51 36.01 |
| ε Hydræ | 3.5 | 8 | 41 | 0.250 | 3.1817 | + 6 49 5.87 |
| * σ ² Cancri (<i>mean</i>) | 5.5 | 8 | 47 | 35.654 | + 3.6731 | + 30 59 30.29 |
| ι Ursæ Majoris | 3.3 | 8 | 51 | 44.599 | + 4.1327 | + 48 28 8.84 |
| 12 Year Cat. 1879 S. P. | 5.3 | 8 | 52 | 31.098 | — 2.5540 | + 99 51 24.48 |
| σ ² Ursæ Majoris | 5.0 | 9 | 0 | 47.866 | + 5.3528 | + 67 34 35.48 |
| * κ Cancri | 5.1 | 9 | 1 | 50.646 | 3.2557 | + 11 6 23.59 |
| * θ Hydræ | 4.0 | 9 | 8 | 41.635 | + 3.1260 | + 2 46 25.39 |
| * β Argûs | 2.0 | 9 | 12 | 0.090 | 0.6772 | — 69 16 5.64 |
| ι Argûs | 2.6 | 9 | 14 | 10.176 | 1.6011 | — 58 49 3.59 |
| * α Lyncis | 3.3 | 9 | 14 | 24.818 | 3.6687 | + 34 51 10.44 |
| * α Cephei S. P. | 2.6 | 9 | 15 | 58.693 | 1.4365 | + 117 52 34.37 |
| ι Draconis (H.) | 4.5 | 9 | 21 | 30.757 | + 8.9869 | + 81 48 26.47 |
| α Hydræ | 2.1 | 9 | 22 | 13.874 | 2.9491 | — 8 11 11.26 |
| d Ursæ Majoris | 4.8 | 9 | 24 | 50.123 | 5.3983 | + 70 18 31.75 |
| θ Ursæ Majoris | 3.2 | 9 | 25 | 33.838 | 4.0403 | + 52 10 25.11 |
| β Cephei (<i>pr.</i>) S. P. | 3.4 | 9 | 27 | 15.099 | 0.7935 | + 109 55 4.17 |
| * 10 Leonis Minoris | 4.7 | 9 | 27 | 32.765 | + 3.6937 | + 36 52 52.25 |
| * υ Leonis | 3.8 | 9 | 35 | 19.989 | + 3.2068 | + 10 23 16.37 |
| * ζ Chamæleontis | 5.2 | 9 | 37 | 4.810 | — 1.5669 | — 80 27 5.27 |
| ε Leonis | 3.2 | 9 | 39 | 39.847 | + 3.4148 | + 24 16 32.87 |
| 11 Cephei S. P. | 4.8 | 9 | 40 | 19.534 | 0.9008 | + 109 11 25.41 |
| μ Leonis | 4.0 | 9 | 46 | 33.862 | + 3.4219 | + 26 31 12.13 |
| * 19 Leonis Minoris | 5.2 | 9 | 51 | 0.499 | 3.6948 | + 41 34 27.89 |
| 79 Draconis S. P. | 6.6 | 9 | 51 | 30.365 | 0.7285 | + 106 48 47.93 |
| * π Leonis | 5.0 | 9 | 54 | 27.203 | 3.1742 | + 8 34 0.88 |
| α Leonis (<i>Regulus</i>) | 1.3 | 10 | 2 | 34.029 | 3.2004 | + 12 29 58.89 |
| 32 Ursæ Majoris | 5.7 | 10 | 10 | 6.866 | + 4.4190 | + 65 39 5.90 |
| * λ Ursæ Majoris | 3.6 | 10 | 10 | 31.321 | 3.6390 | + 43 27 29.29 |
| γ ¹ Leonis | 2.5 | 10 | 13 | 57.785 | 3.3146 | + 20 23 33.68 |
| * μ Hydræ | 4.1 | 10 | 20 | 49.172 | 2.9007 | — 16 16 49.31 |
| * β Leonis Minoris | 4.3 | 10 | 21 | 34.806 | 3.4861 | + 37 15 56.07 |
| * α Antliæ | 4.5 | 10 | 22 | 9.816 | + 2.7392 | — 30 30 48.03 |
| 9 Draconis (H.) | 5.0 | 10 | 25 | 49.525 | 5.2586 | + 76 16 26.72 |
| ρ Leonis | 4.0 | 10 | 27 | 4.348 | 3.1640 | + 9 52 2.12 |
| 226 Cephei (B.) S. P. | 5.7 | 10 | 30 | 21.613 | 1.0769 | + 104 20 7.11 |
| * β Octantis S. P. | 4.4 | 10 | 34 | 52.963 | + 6.4745 | — 98 2 51.36 |

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1891.0. (January 0^d.0—0^d.078, Washington.)

| Name of Star. | Magn. tude. | Right Ascension. | Annual Variation. | Declination. | Annual Variation. |
|---|----------------|--|----------------------|--|----------------------|
| | | ^h ^m ^s | ^s | [°] ['] ["] | ["] |
| * 41 Leonis Minoris . . . | 5.1 | 10 37 29.354 | + 3.2705 | + 23 45 31.96 | — 18.741 |
| γ Argūs (<i>var.</i>) . . . | 1-6 | 10 40 49.904 | 2.3138 | — 59 6 41.57 | 18.872 |
| l Leonis . . . | 5.3 | 10 43 31.703 | 3.1584 | + 11 7 18.45 | 18.975 |
| * δ ² Chamæleontis . . . | 4.7 | 10 44 45.525 | 0.6363 | — 79 57 56.00 | 18.982 |
| ε Cephei . . . S. P. | 3.6 | 10 45 47.923 | 2.1222 | + 114 22 22.47 | 18.878 |
| * 46 Leonis Minoris . . . | 3.9 | 10 47 12.929 | + 3.3692 | + 34 48 9.19 | — 19.298 |
| * Groombridge 1706 . . . | 6.3 | 10 51 13.310 | 4.9649 | + 78 21 14.28 | 19.185 |
| α Ursæ Majoris . . . | 2.0 | 10 56 59.887 | + 3.7461 | + 62 20 21.62 | 19.366 |
| * η Octantis . . . | 6.1 | 11 0 4.716 | — 0.2190 | — 84 0 27.17 | 19.371 |
| * p ³ Leonis . . . | 6.2 | 11 1 20.520 | + 3.0597 | + 2 32 49.53 | 19.486 |
| * ψ Ursæ Majoris . . . | 3.2 | 11 3 32.065 | + 3.3928 | + 45 5 22.11 | — 19.506 |
| δ Leonis . . . | 2.7 | 11 8 18.699 | 3.1981 | + 21 7 14.72 | 19.688 |
| * ν Ursæ Majoris . . . | 3.7 | 11 12 35.611 | 3.2573 | + 33 41 20.51 | 19.575 |
| δ Crateris . . . | 3.9 | 11 13 53.490 | 2.9965 | — 14 11 20.07 | 19.466 |
| ο Cephei . . . S. P. | 5.1 | 11 14 9.111 | 2.4446 | + 112 29 5.10 | 19.671 |
| τ Leonis . . . | 5.1 | 11 22 19.900 | + 3.0861 | + 3 27 23.17 | — 19.804 |
| λ Draconis . . . | 4.0 | 11 24 55.618 | 3.8197 | + 69 55 57.30 | 19.839 |
| * ξ Hydræ . . . | 3.8 | 11 27 38.425 | 2.9432 | — 31 15 16.83 | 19.887 |
| ο Leonis . . . | 4.4 | 11 31 22.074 | 3.0713 | — 0 13 19.46 | 19.862 |
| γ Cephei . . . S. P. | 3.5 | 11 34 52.381 | 2.4166 | + 102 58 33.95 | 20.076 |
| * χ Ursæ Majoris . . . | 3.9 | 11 40 17.667 | + 3.1899 | + 48 23 1.29 | — 19.963 |
| β Leonis . . . | 2.2 | 11 43 29.995 | 3.0639 | + 15 10 52.73 | 20.120 |
| γ Ursæ Majoris . . . | 2.4 | 11 48 5.845 | 3.1811 | + 54 18 2.43 | 20.028 |
| Groombr. 4163 . . . S. P. | 7.0 | 11 49 32.076 | 2.8665 | + 106 11 46.61 | 20.023 |
| * π Virginis . . . | 4.6 | 11 55 17.208 | 3.0741 | + 7 13 19.01 | 20.087 |
| ο Virginis . . . | 4.3 | 11 59 39.397 | + 3.0575 | + 9 20 18.12 | — 20.015 |
| * ε Corvi . . . | 3.2 | 12 4 31.116 | 3.0832 | — 22 0 48.61 | 20.049 |
| 4 Draconis (H.) . . . | 5.1 | 12 7 5.675 | 2.8840 | + 78 13 18.96 | 20.022 |
| γ Corvi . . . | 2.7 | 12 10 12.046 | 3.0797 | — 16 56 12.22 | 20.017 |
| * 2 Canum Venaticorum . . . | 6.0 | 12 10 39.846 | 3.0217 | + 41 16 1.39 | 20.065 |
| β Chamæleontis . . . | 4.5 | 12 11 57.682 | + 3.4030 | — 78 42 24.38 | — 20.002 |
| η Virginis . . . | 4.0 | 12 14 19.769 | 3.0687 | — 0 3 39.96 | 20.041 |
| * 6 Ursæ Minoris . . . | 6.2 | 12 14 20.556 | 0.1710 | + 88 18 15.49 | 19.940 |
| α ¹ Crucis . . . | 0.9 | 12 20 32.317 | 3.2963 | — 62 29 41.71 | 20.013 |
| * δ ³ Corvi . . . | 3.1 | 12 24 13.592 | 3.1027 | — 15 54 30.10 | 20.084 |
| * β Canum Venaticorum . . . | 4.4 | 12 28 33.976 | + 2.8592 | + 41 56 59.07 | — 19.615 |
| β Corvi . . . | 2.8 | 12 28 39.689 | 3.1419 | — 22 47 38.23 | 19.962 |
| κ Draconis . . . | 3.8 | 12 28 49.816 | 2.5910 | + 70 23 20.55 | 19.889 |
| * γ Virginis (<i>mean</i>) . . . | 2.9 | 12 36 8.249 | 3.0384 | — 0 51 6.21 | 19.811 |
| 21 Cassiopeæ . . . S. P. | 5.7 | 12 38 27.080 | 3.8601 | + 105 36 28.18 | 19.751 |
| * 31 Comæ Berenices . . . | 5.1 | 12 46 23.455 | + 2.9299 | + 28 8 1.62 | — 19.660 |
| 32 ² Camelopardalis (H.) . . . | 5.2 | 12 48 19.853 | 0.3961 | + 84 0 19.17 | 19.596 |
| * γ Cassiopeæ . . . S. P. | 2.3 | 12 50 7.860 | 3.5801 | + 119 52 25.48 | 19.562 |
| α Canum Venaticorum . . . | 3.2 | 12 50 55.776 | 2.8153 | + 38 54 25.41 | 19.511 |
| * 43 Cephei (H.) . . . S. P. | 4.6 | 12 53 55.448 | 7.2565 | + 94 19 40.48 | 19.500 |
| * δ Muscæ . . . | 3.8 | 12 54 47.261 | + 4.1464 | — 70 57 37.60 | — 19.474 |
| * ε Virginis . . . | 3.1 | 12 56 45.091 | 2.9879 | + 11 32 42.20 | 19.416 |
| θ Virginis . . . | 4.6 | 13 4 18.351 | 3.1013 | — 4 57 25.23 | 19.310 |
| * 20 Canum Venaticorum . . . | 4.7 | 13 12 39.295 | 2.6966 | + 41 8 47.46 | 19.034 |
| α Urs. Min. (<i>Polaris</i>) S. P. | 2.2 | 13 18 54.555 | + 23.5100 | + 91 16 22.72 | — 18.876 |

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1891.0. (January 0^d.0—0^d.078, Washington.)

| Name of Star. | Magni- tude. | Right Ascension. | | | Annual Variation. | Declination. | | | Annual Variation. |
|---|-----------------|------------------|--------------|--------------|----------------------|--------------|--------------|--------------|----------------------|
| | | ^h | ^m | ^s | ^s | [°] | ['] | ["] | ["] |
| α Virginis (<i>Spica</i>) . . . | 1.1 | 13 | 19 | 27.020 | + 3.1539 | — 10 | 35 | 32.26 | — 18.898 |
| 38 Cassiopeæ . . . S. P. | 5.9 | 13 | 23 | 7.308 | 4.3800 | + 110 | 17 | 48.05 | 18.673 |
| * κ Octantis . . . | 5.4 | 13 | 23 | 24.392 | 8.7687 | — 85 | 13 | 36.36 | 18.741 |
| ζ Virginis . . . | 3.6 | 13 | 29 | 8.329 | 3.0532 | — 0 | 2 | 18.43 | 18.515 |
| * B. A. C. 4536 . . . | 5.0 | 13 | 29 | 55.751 | 2.6822 | + 37 | 44 | 27.27 | 18.537 |
| * m Virginis . . . | 5.4 | 13 | 35 | 53.461 | + 3.1434 | — 8 | 9 | 9.85 | — 18.983 |
| η Ursæ Majoris . . . | 1.9 | 13 | 43 | 14.782 | 2.3711 | + 49 | 51 | 26.37 | 18.077 |
| η Bootis . . . | 2.8 | 13 | 49 | 29.694 | 2.8568 | + 18 | 56 | 39.47 | 18.168 |
| 50 Cassiopeæ . . . S. P. | 4.1 | 13 | 54 | 7.855 | 5.0140 | + 108 | 6 | 23.45 | 17.641 |
| * θ Apodis . . . | Var. | 13 | 54 | 43.514 | 5.6792 | — 76 | 16 | 11.09 | 17.584 |
| β Centauri . . . | 0.7 | 13 | 56 | 7.830 | + 4.1790 | — 59 | 50 | 48.90 | — 17.586 |
| * κ Hydræ . . . | 3.6 | 14 | 0 | 9.810 | 3.4012 | — 26 | 9 | 22.74 | 17.360 |
| α Draconis . . . | 3.7 | 14 | 1 | 26.354 | 1.6238 | + 64 | 53 | 48.41 | 17.297 |
| * d Bootis . . . | 4.8 | 14 | 5 | 25.712 | 2.7387 | + 25 | 36 | 29.30 | 17.197 |
| * κ Virginis . . . | 4.2 | 14 | 7 | 4.881 | + 3.1941 | — 9 | 45 | 58.24 | 16.922 |
| * 4 Ursæ Minoris . . . | 4.9 | 14 | 9 | 16.701 | — 0.3203 | + 78 | 8 | 35.14 | — 16.906 |
| * δ Octantis . . . | 5.0 | 14 | 9 | 30.333 | + 8.9931 | — 83 | 10 | 3.00 | 16.944 |
| α Bootis (<i>Arcturus</i>) . . . | 0.2 | 14 | 10 | 41.389 | 2.7350 | + 19 | 45 | 0.22 | 18.881 |
| * λ Bootis . . . | 4.3 | 14 | 12 | 14.391 | 2.2626 | + 46 | 35 | 20.16 | 16.658 |
| * λ Virginis . . . | 4.7 | 14 | 13 | 12.705 | 3.2382 | — 12 | 52 | 9.03 | 16.743 |
| ϵ Cassiopeæ . . . S. P. | 4.6 | 14 | 20 | 5.014 | + 4.8643 | + 113 | 5 | 17.37 | — 16.427 |
| θ Bootis . . . | 4.1 | 14 | 21 | 29.229 | 2.0442 | + 52 | 21 | 16.74 | 16.759 |
| ρ Bootis . . . | 3.6 | 14 | 27 | 8.012 | + 2.5877 | + 30 | 51 | 0.02 | 15.958 |
| 5 Ursæ Minoris . . . | 4.5 | 14 | 27 | 45.610 | — 0.1884 | + 76 | 10 | 49.84 | 16.012 |
| α^2 Centauri . . . | 0.2 | 14 | 32 | 13.091 | + 4.0471 | — 60 | 23 | 17.99 | 15.371 |
| * μ Hydri . . . S. P. | 5.3 | 14 | 33 | 59.107 | — 1.4313 | — 100 | 24 | 55.44 | — 15.683 |
| * α Apodis . . . | 4.1 | 14 | 34 | 20.877 | + 7.2006 | — 78 | 34 | 52.96 | 15.675 |
| * 33 Bootis . . . | 5.3 | 14 | 34 | 46.842 | 2.2343 | + 44 | 52 | 29.72 | 15.708 |
| ϵ Bootis . . . | 2.6 | 14 | 40 | 13.664 | 2.6214 | + 27 | 32 | 2.10 | 15.338 |
| α^2 Libræ . . . | 2.9 | 14 | 44 | 50.872 | + 3.3097 | — 15 | 35 | 18.70 | 15.165 |
| β Ursæ Minoris . . . | 2.2 | 14 | 51 | 1.596 | — 0.2294 | + 74 | 36 | 3.33 | — 14.719 |
| * 47 Cephei (H.) . . . S. P. | 5.7 | 14 | 51 | 36.556 | + 7.7289 | + 101 | 0 | 47.12 | 14.684 |
| * γ Scorpii . . . | 3.4 | 14 | 57 | 41.410 | 3.4997 | — 24 | 51 | 11.49 | 14.374 |
| β Bootis . . . | 3.7 | 14 | 57 | 50.437 | 2.2601 | + 40 | 49 | 14.24 | 14.358 |
| 48 Cephei (H.) . . . S. P. | 5.5 | 15 | 6 | 30.109 | 7.4125 | + 102 | 40 | 0.30 | 13.719 |
| * δ Bootis . . . | 3.5 | 15 | 11 | 6.547 | + 2.4209 | + 33 | 43 | 18.63 | — 13.581 |
| β Libræ . . . | 2.9 | 15 | 11 | 8.476 | 3.2219 | — 8 | 58 | 49.52 | 13.504 |
| * ρ Octantis . . . | 5.7 | 15 | 18 | 13.867 | 12.9997 | — 84 | 6 | 0.06 | 12.964 |
| μ^1 Bootis . . . | 4.5 | 15 | 20 | 22.384 | + 2.2663 | + 37 | 45 | 34.97 | 12.777 |
| γ^2 Ursæ Minoris . . . | 3.2 | 15 | 20 | 54.278 | — 0.1325 | + 72 | 13 | 18.65 | 12.811 |
| * β Coronæ Borealis . . . | 3.9 | 15 | 23 | 20.132 | + 2.4751 | + 29 | 28 | 53.53 | — 12.591 |
| α Coronæ Borealis . . . | 2.3 | 15 | 30 | 4.394 | 2.5393 | + 27 | 4 | 54.34 | 12.302 |
| * γ Camelop. (H.) . . . S. P. | 4.6 | 15 | 38 | 51.361 | 6.2409 | + 109 | 0 | 16.44 | 11.534 |
| α Serpentis . . . | 2.7 | 15 | 38 | 53.939 | 2.9517 | + 6 | 46 | 7.67 | 11.547 |
| ϵ Serpentis . . . | 3.7 | 15 | 45 | 22.956 | + 2.9872 | + 4 | 48 | 22.44 | 11.044 |
| ζ Ursæ Minoris . . . | 4.6 | 15 | 47 | 57.692 | — 2.2483 | + 78 | 7 | 46.31 | — 10.925 |
| ϵ Coronæ Borealis . . . | 4.1 | 15 | 53 | 4.559 | + 2.4833 | + 27 | 11 | 37.63 | 10.606 |
| δ Scorpii . . . | 2.6 | 15 | 53 | 53.302 | 3.5389 | — 22 | 18 | 39.56 | 10.523 |
| β^1 Scorpii . . . | 2.9 | 15 | 59 | 5.953 | 3.4810 | — 19 | 30 | 24.05 | 10.133 |
| * δ^1 Apodis . . . | 4.9 | 16 | 4 | 4.510 | + 8.7797 | — 78 | 25 | 10.36 | — 9.716 |

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1891.0. (January 0^d.0—0^d.078, Washington.)

| Name of Star. | Magni- tude. | Right Ascension. | | | Annual Variation. | Declination. | | | Annual Variation. |
|--|-----------------|------------------|--------------|--------------|----------------------|--------------|---------------|-------|----------------------|
| | | ^h | ^m | ^s | [°] | ['] | ^{''} | | ^{''} |
| * φ Herculis | 4.2 | 16 | 5 | 19.915 | + 1.8814 | + 45 | 13 | 15.17 | — 9.578 |
| Groombridge 2320 | 5.5 | 16 | 6 | 1.323 | 0.1404 | + 68 | 5 | 50.64 | 9.498 |
| δ Ophiuchi | 2.8 | 16 | 8 | 38.002 | 3.1398 | — 3 | 24 | 47.64 | 9.509 |
| * σ Coronæ Borealis (<i>mean</i>) | 5.3 | 16 | 10 | 35.737 | 2.2448 | + 34 | 8 | 6.89 | 9.253 |
| τ Herculis | 3.9 | 16 | 16 | 27.889 | 1.8011 | + 46 | 34 | 22.78 | 8.732 |
| * γ Apodis | 4.0 | 16 | 16 | 45.282 | + 9.0689 | — 78 | 39 | 3.90 | — 8.732 |
| * η Ursæ Minoris | 5.0 | 16 | 20 | 41.658 | — 1.8147 | + 76 | 0 | 22.81 | 8.165 |
| η Draconis | 2.8 | 16 | 22 | 31.062 | + 0.8066 | + 61 | 45 | 39.45 | 8.220 |
| α Scorpii (<i>Antares</i>) | 1.2 | 16 | 22 | 43.437 | 3.6705 | — 26 | 11 | 22.52 | 8.295 |
| β Herculis | 2.8 | 16 | 25 | 32.053 | + 2.5775 | + 21 | 43 | 38.94 | 8.052 |
| Λ Draconis | 5.0 | 16 | 28 | 12.041 | — 0.1343 | + 69 | 0 | 13.53 | — 7.798 |
| ζ Ophiuchi | 2.8 | 16 | 31 | 9.402 | + 3.2992 | — 10 | 20 | 45.08 | 7.559 |
| α Trianguli Australis | 2.2 | 16 | 37 | 7.681 | 6.3050 | — 68 | 49 | 34.80 | 7.144 |
| η Herculis | 3.7 | 16 | 39 | 9.518 | 2.0539 | + 39 | 7 | 47.25 | 7.018 |
| α Camelopardalis S. P. | 4.4 | 16 | 43 | 12.742 | 5.9261 | + 113 | 50 | 36.75 | 6.592 |
| κ Ophiuchi | 3.4 | 16 | 52 | 30.542 | + 2.8375 | + 9 | 32 | 41.72 | — 5.826 |
| ϵ Ursæ Minoris | 4.5 | 16 | 57 | 9.282 | — 6.3266 | + 82 | 12 | 56.70 | 5.433 |
| d Herculis | 5.3 | 16 | 57 | 34.896 | + 2.2113 | + 33 | 43 | 35.08 | 5.392 |
| * η Ophiuchi | 2.5 | 17 | 4 | 7.577 | 3.4356 | — 15 | 35 | 22.14 | 4.762 |
| α^1 Herculis (<i>var.</i>) | 3.1 | 17 | 9 | 40.638 | 2.7336 | + 14 | 30 | 53.80 | 4.340 |
| * π Herculis | 3.4 | 17 | 11 | 15.062 | + 2.0892 | + 36 | 55 | 56.05 | — 4.225 |
| * θ Ophiuchi | 3.3 | 17 | 15 | 18.902 | 3.6794 | — 24 | 53 | 24.94 | 3.938 |
| b Ophiuchi (<i>var.</i>) | 4.4 | 17 | 19 | 42.800 | 3.6591 | — 24 | 4 | 27.93 | 3.638 |
| * δ Aræ | 3.8 | 17 | 21 | 15.695 | 5.4020 | — 60 | 35 | 31.93 | 3.514 |
| Groombr. 966 S. P. | 6.4 | 17 | 25 | 9.557 | 8.0018 | + 105 | 1 | 47.22 | 3.556 |
| * Groombr. 944 S. P. | 6.4 | 17 | 27 | 7.005 | + 18.6614 | + 94 | 51 | 34.57 | — 2.880 |
| β Draconis | 3.0 | 17 | 27 | 58.224 | 1.3535 | + 52 | 22 | 55.61 | 2.794 |
| α Ophiuchi | 2.2 | 17 | 29 | 52.482 | 2.7830 | + 12 | 38 | 23.08 | 2.865 |
| * ϵ Herculis | 4.0 | 17 | 36 | 23.396 | + 1.6967 | + 46 | 3 | 52.12 | 2.063 |
| ω Draconis | 4.9 | 17 | 37 | 35.449 | — 0.3536 | + 68 | 48 | 29.67 | 1.634 |
| μ Herculis | 3.5 | 17 | 42 | 11.585 | + 2.3464 | + 27 | 47 | 4.68 | — 2.317 |
| ψ^1 Draconis | 4.8 | 17 | 43 | 52.599 | — 1.0788 | + 72 | 12 | 7.52 | 1.683 |
| * θ Herculis | 3.9 | 17 | 52 | 30.864 | + 2.0552 | + 37 | 15 | 54.81 | 0.636 |
| γ Draconis | 2.5 | 17 | 54 | 4.505 | 1.3916 | + 51 | 30 | 6.41 | 0.548 |
| γ^3 Sagittarii | 2.9 | 17 | 58 | 48.338 | 3.8516 | — 30 | 25 | 29.42 | — 0.323 |
| * ν Herculis | 3.9 | 18 | 3 | 17.446 | + 2.3394 | + 28 | 44 | 51.87 | + 0.291 |
| 22 Camelop. (H.) S. P. | 4.7 | 18 | 6 | 49.820 | 6.6172 | + 110 | 38 | 35.13 | 0.716 |
| μ^1 Sagittarii | 4.1 | 18 | 7 | 14.684 | + 3.5866 | — 21 | 5 | 12.32 | 0.621 |
| δ Ursæ Minoris | 4.4 | 18 | 7 | 28.173 | — 19.4690 | + 86 | 36 | 42.48 | 0.704 |
| η Serpentis | 3.5 | 18 | 15 | 40.178 | + 3.1024 | — 2 | 55 | 34.96 | 0.695 |
| * λ Sagittarii | 2.9 | 18 | 21 | 14.621 | + 3.7026 | — 25 | 28 | 53.61 | + 1.633 |
| * χ Draconis | 5.3 | 18 | 23 | 1.256 | — 1.0797 | + 72 | 41 | 7.11 | 1.635 |
| 1 Aquilæ | 4.0 | 18 | 29 | 16.536 | + 3.2645 | — 8 | 19 | 11.62 | 2.225 |
| * ζ Pavonis | 4.2 | 18 | 30 | 17.709 | 7.0286 | — 71 | 31 | 10.89 | 2.502 |
| α Lyræ (<i>Vega</i>) | 0.2 | 18 | 33 | 14.896 | 2.0313 | + 38 | 40 | 56.53 | 3.172 |
| σ Octantis | 5.6 | 18 | 44 | 8.902 | + 105.6500 | — 89 | 15 | 57.41 | + 3.821 |
| β Lyræ (<i>var.</i>) | 3.6 | 18 | 46 | 3.351 | 2.2142 | + 33 | 14 | 10.57 | 3.985 |
| σ Sagittarii | 2.3 | 18 | 48 | 30.391 | 3.7216 | — 26 | 25 | 53.54 | 4.135 |
| 51 Cephei (H.) S. P. | 5.3 | 18 | 49 | 15.172 | + 29.8670 | + 92 | 46 | 59.22 | 4.314 |
| 50 Draconis | 5.6 | 18 | 49 | 53.149 | — 1.9088 | + 75 | 18 | 18.50 | + 4.405 |

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1891.0. (January 0^d.0—0^d.078, Washington.)

| Name of Star. | Magni- tude. | Right Ascension. | | | Annual Variation. | Declination. | | | Annual Variation. |
|---|-----------------|------------------|--------------|--------------|----------------------|--------------|--------------|--------------|----------------------|
| | | ^h | ^m | ^s | ^s | [°] | ['] | ["] | |
| * γ Lyræ | 3.3 | 18 | 54 | 51.990 | + 2.2444 | + 32 | 32 | 25.22 | + 4.766 |
| ζ Aquilæ | 3.1 | 19 | 0 | 24.022 | 2.7569 | + 13 | 42 | 6.44 | 5.120 |
| * ϵ Lyræ | 5.2 | 19 | 3 | 24.767 | 2.14 2 | + 35 | 55 | 46.44 | 5.487 |
| * 25 Camelopardalis . S. P. | 5.3 | 19 | 8 | 7.605 | 12.9513 | + 97 | 22 | 49.46 | 5.905 |
| d Sagittarii | 5.0 | 19 | 11 | 15.438 | 3.5132 | — 19 | 8 | 46.84 | 6.117 |
| δ Draconis | 3.1 | 19 | 12 | 31.768 | + 0.0292 | + 67 | 28 | 11.27 | + 6.326 |
| * θ Lyræ | 4.4 | 19 | 12 | 35.029 | + 2.0790 | + 37 | 56 | 22.97 | 6.246 |
| τ Draconis | 4.5 | 19 | 17 | 38.903 | — 1.1179 | + 73 | 9 | 10.63 | 6.773 |
| Piazzi vii. 67 S. P. | 5.7 | 19 | 19 | 32.287 | + 6.2973 | + 111 | 18 | 45.52 | 6.858 |
| δ Aquilæ | 3.5 | 19 | 20 | 0.153 | 3.0252 | + 2 | 53 | 52.23 | 6.935 |
| * β Cygni | 3.1 | 19 | 26 | 19.543 | + 2.4194 | + 27 | 43 | 51.55 | + 7.368 |
| κ Aquilæ | 5.0 | 19 | 31 | 1.633 | + 3.2288 | — 7 | 16 | 9.51 | 7.757 |
| λ Ursæ Minoris | 6.5 | 19 | 32 | 29.969 | — 65.3160 | + 88 | 58 | 8.48 | 7.884 |
| * β Sagittæ | 4.5 | 19 | 36 | 9.212 | + 2.6955 | + 17 | 13 | 25.24 | 8.140 |
| γ Aquilæ | 2.8 | 19 | 41 | 4.662 | 2.8522 | + 10 | 20 | 52.65 | 8.551 |
| * δ Cygni | 2.9 | 19 | 41 | 34.125 | + 1.8761 | + 44 | 51 | 53.36 | + 8.635 |
| α Aquilæ (<i>Altair</i>) | 0.9 | 19 | 45 | 27.915 | 2.9276 | + 8 | 34 | 50.68 | 9.277 |
| * Groombr. 1374 S. P. | 5.6 | 19 | 47 | 8.280 | 7.2830 | + 105 | 47 | 31.30 | 9.070 |
| * ϵ Pavonis | 4.1 | 19 | 47 | 58.298 | + 7.0170 | — 73 | 11 | 47.09 | 9.101 |
| ϵ Draconis | 3.9 | 19 | 48 | 32.275 | — 0.1799 | + 69 | 59 | 25.18 | 9.173 |
| β Aquilæ | 3.9 | 19 | 49 | 57.549 | + 2.9471 | + 6 | 8 | 5.22 | + 8.765 |
| * γ Sagittæ | 3.6 | 19 | 53 | 54.591 | 2.6678 | + 19 | 11 | 47.28 | 9.599 |
| * c Sagittarii | 4.5 | 19 | 55 | 57.357 | 3.6967 | — 28 | 0 | 44.13 | 9.735 |
| τ Aquilæ | 5.7 | 19 | 58 | 48.963 | 2.9330 | + 6 | 58 | 14.21 | 9.944 |
| 3 Ursæ Majoris (H.) . S. P. | 5.5 | 20 | 1 | 57.880 | 6.0471 | + 111 | 12 | 21.60 | 10.172 |
| * θ Aquilæ | 3.3 | 20 | 5 | 40.818 | + 3.0971 | — 1 | 8 | 40.24 | + 10.463 |
| * 31 Cygni | 3.9 | 20 | 10 | 11.975 | 1.8893 | + 46 | 24 | 39.12 | 10.792 |
| α^2 Capricorni | 3.7 | 20 | 12 | 0.414 | + 3.3320 | — 12 | 52 | 56.19 | 10.922 |
| κ Cephei (<i>pr.</i>) | 4.4 | 20 | 12 | 33.033 | — 1.9257 | + 77 | 22 | 58.58 | 10.990 |
| α Pavonis | 2.1 | 20 | 17 | 1.764 | + 4.7831 | — 57 | 5 | 0.71 | 11.197 |
| γ Cygni | 2.3 | 20 | 18 | 19.091 | + 2.1538 | + 39 | 54 | 28.47 | + 11.374 |
| π Capricorni | 5.1 | 20 | 21 | 4.951 | 3.4394 | — 18 | 34 | 7.18 | 11.562 |
| ϵ Delphini | 4.0 | 20 | 28 | 0.359 | + 2.8672 | + 10 | 55 | 59.49 | 12.047 |
| Groombridge 3241 | 6.5 | 20 | 30 | 28.440 | — 0.9209 | + 72 | 9 | 44.56 | 12.220 |
| * α Delphini | 3.9 | 20 | 34 | 34.514 | + 2.7878 | + 15 | 31 | 39.87 | 12.525 |
| * β Pavonis | 3.4 | 20 | 35 | 7.925 | + 5.4722 | — 66 | 35 | 38.16 | + 12.538 |
| α Cygni | 1.4 | 20 | 37 | 42.983 | 2.0444 | + 44 | 53 | 27.32 | 12.728 |
| * ψ Capricorni | 4.3 | 20 | 39 | 38.506 | 3.5605 | — 25 | 39 | 43.87 | 12.703 |
| * ϵ Cygni | 2.6 | 20 | 41 | 48.066 | 2.4277 | + 33 | 33 | 43.40 | 13.343 |
| μ Aquarii | 4.8 | 20 | 46 | 46.494 | + 3.2397 | — 9 | 23 | 31.37 | 13.295 |
| 12 Year Catalogue, 1879. | 5.3 | 20 | 52 | 31.098 | — 2.5540 | + 80 | 8 | 35.52 | + 13.679 |
| ν Cygni | 4.1 | 20 | 53 | 6.569 | + 2.2342 | + 40 | 44 | 51.56 | 13.728 |
| α^2 Ursæ Majoris S. P. | 5.0 | 21 | 0 | 47.866 | 5.3528 | + 112 | 25 | 24.52 | 14.284 |
| 61 ¹ Cygni | 5.4 | 21 | 2 | 0.646 | 2.6833 | + 38 | 12 | 48.67 | 17.536 |
| ζ Cygni | 3.3 | 21 | 8 | 17.795 | 2.5497 | + 29 | 46 | 47.76 | 14.614 |
| * τ Cygni | 3.8 | 21 | 10 | 26.423 | + 2.3935 | + 37 | 34 | 49.01 | + 15.267 |
| α Cephei | 2.6 | 21 | 15 | 58.693 | 1.4365 | + 62 | 7 | 25.63 | 15.175 |
| 1 Pegasi | 4.3 | 21 | 17 | 2.704 | 2.7722 | + 19 | 20 | 17.94 | 15.245 |
| * ζ Capricorni | 3.8 | 21 | 20 | 26.660 | 3.4342 | — 22 | 52 | 59.62 | 15.389 |
| 1 Draconis (H.) S. P. | 4.5 | 21 | 21 | 30.757 | + 8.9869 | + 98 | 11 | 33.53 | + 15.465 |

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1891.0. (January 0^d.0—0^d.078, Washington.)

| Name of Star. | | Magni- tude. | Right Ascension. | Annual Variation. | Declination. | Annual Variation. |
|---|-------|-----------------|--|----------------------|--|----------------------|
| | | | ^h ^m ^s | ^s | [°] ['] ["] | ["] |
| <i>d</i> Ursæ Majoris | S. P. | 4.8 | 21 24 50.123 | + 5.3983 | + 109 41 28.25 | + 15.569 |
| <i>β</i> Aquarii | | 2.9 | 21 25 49.261 | 3.1616 | — 6 3 1.76 | 15.667 |
| <i>β</i> Cephei (<i>pr.</i>) | | 3.4 | 21 27 15.099 | 0.7935 | + 70 4 55.83 | 15.757 |
| <i>ξ</i> Aquarii | | 4.8 | 21 31 56.990 | 3.1978 | — 8 20 34.11 | 15.977 |
| * 74 Cygni | | 5.0 | 21 32 31.812 | 2.4016 | + 39 55 25.70 | 16.055 |
| * <i>λ</i> ¹ Octantis | | 5.4 | 21 34 8.045 | + 9.7707 | — 83 13 10.10 | + 16.048 |
| * <i>ζ</i> Chamæleontis | S. P. | 5.2 | 21 37 4.810 | — 1.5670 | — 99 32 54.73 | 16.285 |
| <i>ε</i> Pegasi | | 2.4 | 21 38 49.972 | + 2.9467 | + 9 22 31.63 | 16.361 |
| <i>η</i> Cephei | | 4.8 | 21 40 19.534 | 0.9008 | + 70 48 34.59 | 16.540 |
| * <i>π</i> ² Cygni | | 4.5 | 21 42 45.994 | 2.2133 | + 48 48 19.29 | 16.516 |
| <i>μ</i> Capricorni | | 5.2 | 21 47 21.204 | + 3.2759 | — 14 3 52.80 | + 16.784 |
| * 16 Pegasi | | 5.1 | 21 48 6.148 | 2.7279 | + 25 24 44.75 | 16.823 |
| 79 Draconis | | 6.6 | 21 51 30.365 | 0.7285 | + 73 11 12.07 | 17.014 |
| <i>α</i> Aquarii | | 3.0 | 22 0 11.131 | 3.0826 | — 0 50 57.19 | 17.360 |
| <i>α</i> Gruis | | 1.9 | 22 1 21.696 | 3.8053 | — 47 29 18.46 | 17.253 |
| * <i>π</i> Pegasi | | 4.3 | 22 5 8.796 | + 2.6602 | + 32 38 36.93 | + 17.584 |
| 32 Ursæ Majoris | S. P. | 5.7 | 22 10 6.866 | 4.4190 | + 114 20 54.10 | 17.817 |
| * <i>ν</i> Octantis | | 6.2 | 22 10 38.075 | 13.1238 | — 86 31 14.25 | 17.900 |
| <i>θ</i> Aquarii | | 4.4 | 22 11 4.920 | 3.1690 | — 8 19 33.16 | 17.806 |
| * <i>γ</i> Aquarii | | 4.0 | 22 16 1.562 | 3.1007 | — 1 56 11.30 | 18.043 |
| <i>σ</i> Aquarii | | 4.6 | 22 19 42.642 | + 3.0647 | + 0 49 27.94 | + 18.159 |
| * <i>π</i> Aquarii | | 4.9 | 22 24 52.694 | 3.1781 | — 11 14 7.98 | 18.322 |
| 9 Draconis | S. P. | 5.0 | 22 25 49.525 | 5.2586 | + 103 43 33.28 | 18.400 |
| * <i>α</i> Lacertæ | | 3.9 | 22 26 48.036 | 2.4624 | + 49 43 19.60 | 18.418 |
| <i>η</i> Aquarii | | 4.2 | 22 29 45.315 | 3.0836 | — 0 40 45.04 | 18.461 |
| 226 Cephei (B.) | | 5.7 | 22 30 21.613 | + 1.0769 | + 75 39 52.89 | + 18.530 |
| * 10 Lacertæ | | 5.0 | 22 34 22.222 | 2.6867 | + 38 28 58.92 | 18.672 |
| * <i>β</i> Octantis | | 4.4 | 22 34 52.963 | 6.4745 | — 81 57 8.64 | 18.687 |
| <i>ζ</i> Pegasi | | 3.5 | 22 36 1.558 | 2.9910 | + 10 15 44.92 | 18.709 |
| * <i>λ</i> Pegasi | | 4.1 | 22 41 16.843 | 2.8853 | + 22 59 31.69 | 18.877 |
| <i>ι</i> Cephei | | 3.6 | 22 45 47.923 | + 2.1222 | + 65 37 37.53 | + 18.878 |
| <i>λ</i> Aquarii | | 3.8 | 22 46 55.704 | 3.1327 | — 8 9 34.02 | 19.077 |
| * Groombr. 1706 | S. P. | 6.3 | 22 51 13.310 | 4.9649 | + 101 38 45.72 | 19.185 |
| <i>α</i> Pis. Aus. (<i>Fomalhaut</i>) | | 1.3 | 22 51 37.607 | 3.3245 | — 30 11 59.32 | 18.906 |
| * <i>ν</i> Andromedæ | | 3.8 | 22 56 54.346 | 2.7501 | + 41 44 24.29 | 19.289 |
| <i>α</i> Ursæ Majoris | S. P. | 2.0 | 22 56 59.887 | + 3.7461 | + 117 39 38.38 | + 19.366 |
| <i>α</i> Pegasi (<i>Markab</i>) | | 2.5 | 22 59 19.880 | 2.9850 | + 14 37 7.73 | 19.304 |
| * <i>φ</i> Aquarii | | 4.3 | 23 8 40.667 | 3.1087 | — 6 38 11.32 | 19.360 |
| <i>ν</i> Cephei | | 5.1 | 23 14 9.111 | 2.4446 | + 67 30 54.90 | 19.671 |
| * <i>τ</i> Pegasi | | 4.6 | 23 15 14.507 | 2.9637 | + 23 8 37.02 | 19.657 |
| <i>θ</i> Piscium | | 4.3 | 23 22 26.323 | + 3.0412 | + 5 46 48.59 | + 19.728 |
| <i>λ</i> Draconis | S. P. | 4.0 | 23 24 55.618 | 3.6197 | + 110 4 2.70 | 19.839 |
| * <i>λ</i> Andromedæ | | 3.8 | 23 32 13.788 | 2.9226 | + 45 52 2.46 | 19.473 |
| <i>ι</i> Piscium | | 4.3 | 23 34 20.639 | 3.0842 | + 5 2 7.88 | 19.484 |
| <i>γ</i> Cephei | | 3.5 | 23 34 52.381 | 2.4166 | + 77 1 26.05 | 20.076 |
| * <i>i</i> ¹ Aquarii | | 5.2 | 23 38 32.917 | + 3.1168 | — 18 52 54.49 | + 19.560 |
| * <i>δ</i> Sculptoris | | 4.6 | 23 43 14.910 | 3.1322 | — 28 43 58.06 | 19.857 |
| * <i>γ</i> ¹ Octantis | | 5.2 | 23 45 41.051 | 3.6847 | — 82 37 28.59 | 19.993 |
| Groombridge 4163 | | 6.6 | 23 49 32.076 | 2.8665 | + 73 48 13.39 | 20.023 |
| <i>ω</i> Piscium | | 4.2 | 23 53 42.850 | 3.0785 | + 6 15 35.36 | 19.931 |
| * 33 Piscium | | 4.7 | 23 59 45.382 | + 3.0708 | — 6 19 2.00 | + 20.148 |

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| <i>a</i> Ursæ Minoris. (Polaris.) | | | 51 Cephei (Hev.) | | | <i>δ</i> Ursæ Minoris. | | | <i>λ</i> Ursæ Minoris. | | |
|--------------------------------------|-----------------------------------|----------------------------|------------------------|-----------------------------------|----------------------------|------------------------|-----------------------------------|----------------------------|------------------------|------------------------------------|----------------------------|
| Mean Solar Date. | Right Ascen- sion. | Declina- tion North. | Mean Solar Date. | Right Ascen- sion. | Declina- tion North. | Mean Solar Date. | Right Ascen- sion. | Declina- tion North. | Mean Solar Date. | Right Ascen- sion. | Declina- tion North. |
| Jan. | ^h ^m 1 18 | +88° 43' | Jan. | ^h ^m 6 49 | +87° 13' | Jan. | ^h ^m 18 7 | +86° 36' | Jan. | ^h ^m 19 31 | +88° 57' |
| 0.3 | ^s 51.61 | 52.2 | 0.5 | ^s 34.42 | 3.4 | 0.9 | ^s 11.44 | 36.9 | 1.1 | ^s 33.43 | 68.4 |
| 1.3 | 50.58 | 52.3 | 1.5 | 34.46 | 3.7 | 1.9 | 11.47 | 36.6 | 2.0 | 33.09 | 68.1 |
| 2.3 | 49.59 | 52.3 | 2.5 | 34.51 | 4.0 | 2.9 | 11.52 | 36.3 | 3.0 | 32.77 | 67.8 |
| 3.3 | 48.66 | 52.4 | 3.5 | 34.56 | 4.3 | 3.9 | 11.56 | 35.9 | 4.0 | 32.44 | 67.5 |
| 4.3 | 47.78 | 52.5 | 4.5 | 34.62 | 4.6 | 4.9 | 11.59 | 35.6 | 5.0 | 32.11 | 67.2 |
| 5.3 | 46.91 | 52.5 | 5.5 | 34.69 | 4.9 | 5.9 | 11.62 | 35.3 | 6.0 | 31.72 | 66.9 |
| 6.3 | 46.04 | 52.6 | 6.5 | 34.78 | 5.2 | 6.9 | 11.62 | 35.0 | 7.0 | 31.32 | 66.6 |
| 7.3 | 45.17 | 52.7 | 7.5 | 34.88 | 5.5 | 7.9 | 11.63 | 34.7 | 8.0 | 30.87 | 66.3 |
| 8.3 | 44.25 | 52.8 | 8.5 | 35.00 | 5.8 | 8.9 | 11.63 | 34.3 | 9.0 | 30.41 | 66.0 |
| 9.2 | 43.27 | 52.9 | 9.5 | 35.11 | 6.2 | 9.9 | 11.65 | 34.0 | 10.0 | 29.97 | 65.7 |
| 10.2 | 42.25 | 53.0 | 10.5 | 35.19 | 6.5 | 10.9 | 11.69 | 33.6 | 11.0 | 29.58 | 65.3 |
| 11.2 | 41.16 | 53.1 | 11.5 | 35.26 | 6.9 | 11.9 | 11.75 | 33.2 | 11.9 | 29.24 | 64.9 |
| 12.2 | 40.07 | 53.2 | 12.5 | 35.28 | 7.3 | 12.9 | 11.83 | 32.8 | 12.9 | 29.00 | 64.6 |
| 13.2 | 38.97 | 53.2 | 13.5 | 35.28 | 7.6 | 13.9 | 11.94 | 32.5 | 13.9 | 28.84 | 64.2 |
| 14.2 | 37.88 | 53.2 | 14.5 | 35.23 | 8.0 | 14.9 | 12.06 | 32.1 | 14.9 | 28.76 | 63.9 |
| 15.2 | 36.82 | 53.2 | 15.5 | 35.19 | 8.3 | 15.9 | 12.19 | 31.8 | 15.9 | 28.72 | 63.5 |
| 16.2 | 35.84 | 53.2 | 16.4 | 35.10 | 8.6 | 16.9 | 12.32 | 31.5 | 16.9 | 28.71 | 63.2 |
| 17.2 | 34.88 | 53.2 | 17.4 | 35.05 | 8.9 | 17.9 | 12.44 | 31.2 | 17.9 | 28.69 | 62.9 |
| 18.2 | 33.99 | 53.2 | 18.4 | 34.99 | 9.2 | 18.9 | 12.56 | 30.9 | 18.9 | 28.67 | 62.6 |
| 19.2 | 33.13 | 53.2 | 19.4 | 34.95 | 9.5 | 19.9 | 12.67 | 30.6 | 19.9 | 28.60 | 62.3 |
| 20.2 | 32.25 | 53.2 | 20.4 | 34.94 | 9.8 | 20.9 | 12.77 | 30.3 | 20.9 | 28.51 | 62.0 |
| 21.2 | 31.35 | 53.2 | 21.4 | 34.91 | 10.1 | 21.9 | 12.89 | 30.0 | 21.9 | 28.41 | 61.7 |
| 22.2 | 30.40 | 53.2 | 22.4 | 34.89 | 10.4 | 22.9 | 13.00 | 29.7 | 22.9 | 28.30 | 61.3 |
| 23.2 | 29.41 | 53.2 | 23.4 | 34.86 | 10.7 | 23.9 | 13.14 | 29.4 | 23.9 | 28.24 | 61.0 |
| 24.2 | 28.36 | 53.2 | 24.4 | 34.80 | 11.1 | 24.9 | 13.29 | 29.0 | 24.9 | 28.24 | 60.6 |
| 25.2 | 27.27 | 53.2 | 25.4 | 34.71 | 11.4 | 25.9 | 13.46 | 28.7 | 25.9 | 28.31 | 60.3 |
| 26.2 | 26.18 | 53.1 | 26.4 | 34.60 | 11.8 | 26.9 | 13.66 | 28.3 | 26.9 | 28.46 | 59.9 |
| 27.2 | 25.09 | 53.1 | 27.4 | 34.43 | 12.1 | 27.9 | 13.89 | 28.0 | 27.9 | 28.69 | 59.5 |
| 28.2 | 24.02 | 53.0 | 28.4 | 34.26 | 12.5 | 28.9 | 14.11 | 27.7 | 28.9 | 28.99 | 59.2 |
| 29.2 | 23.03 | 52.9 | 29.4 | 34.05 | 12.8 | 29.9 | 14.35 | 27.4 | 29.9 | 29.34 | 58.8 |
| 30.2 | 22.06 | 52.8 | 30.4 | 33.85 | 13.1 | 30.9 | 14.58 | 27.2 | 30.9 | 29.69 | 58.5 |
| 31.2 | 21.19 | 52.6 | 31.4 | 33.65 | 13.3 | 31.9 | 14.80 | 26.9 | 31.9 | 30.03 | 58.2 |
| 32.2 | 20.34 | 52.5 | 32.4 | 33.48 | 13.6 | 32.9 | 15.00 | 26.7 | 32.9 | 30.31 | 57.9 |

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Ursæ Minoris. (Polaris.) | | Mean Solar Date. | 51 Cephei (Hæv.) | | Mean Solar Date. | δ Ursæ Minoris. | | Mean Solar Date. | λ Ursæ Minoris. | |
|------------------------|--------------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|---------------------------------|----------------------------|
| | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. |
| Feb. | ^h 1 ^m 17 | +88° 43' | Feb. | ^h 6 ^m 49 | +87° 13' | Feb. | ^h 18 ^m 7 | +86° 36' | Feb. | ^h 19 ^m 31 | +88° 57' |
| 1.2 | ^s 80.34 | 52.5 | 1.4 | ^s 33.48 | 13.6 | 1.9 | ^s 15.00 | 26.7 | 1.9 | ^s 30.31 | 57.9 |
| 2.2 | 79.52 | 52.4 | 2.4 | 33.32 | 13.8 | 2.9 | 15.19 | 26.4 | 2.9 | 30.58 | 57.7 |
| 3.2 | 78.69 | 52.3 | 3.4 | 33.17 | 14.1 | 3.9 | 15.38 | 26.2 | 3.9 | 30.82 | 57.4 |
| 4.2 | 77.84 | 52.3 | 4.4 | 33.04 | 14.4 | 4.9 | 15.57 | 25.9 | 4.9 | 31.00 | 57.1 |
| 5.2 | 76.97 | 52.2 | 5.4 | 32.91 | 14.7 | 5.9 | 15.76 | 25.6 | 5.9 | 31.21 | 56.8 |
| 6.2 | 76.03 | 52.1 | 6.4 | 32.76 | 15.0 | 6.9 | 15.98 | 25.3 | 6.9 | 31.45 | 56.4 |
| 7.2 | 75.05 | 52.1 | 7.4 | 32.60 | 15.3 | 7.9 | 16.21 | 25.0 | 7.9 | 31.74 | 56.1 |
| 8.2 | 74.04 | 52.0 | 8.4 | 32.40 | 15.6 | 8.9 | 16.45 | 24.8 | 8.9 | 32.12 | 55.7 |
| 9.2 | 73.03 | 51.8 | 9.4 | 32.18 | 15.9 | 9.9 | 16.73 | 24.5 | 9.9 | 32.58 | 55.4 |
| 10.2 | 72.05 | 51.7 | 10.4 | 31.92 | 16.2 | 10.9 | 17.00 | 24.2 | 10.9 | 33.12 | 55.1 |
| 11.2 | 71.12 | 51.5 | 11.4 | 31.64 | 16.5 | 11.9 | 17.31 | 24.0 | 11.9 | 33.71 | 54.8 |
| 12.2 | 70.24 | 51.3 | 12.4 | 31.33 | 16.7 | 12.9 | 17.60 | 23.8 | 12.9 | 34.33 | 54.5 |
| 13.2 | 69.43 | 51.1 | 13.4 | 31.03 | 17.0 | 13.9 | 17.89 | 23.6 | 13.9 | 34.97 | 54.2 |
| 14.2 | 68.67 | 51.0 | 14.4 | 30.75 | 17.2 | 14.9 | 18.17 | 23.4 | 14.9 | 35.58 | 53.9 |
| 15.1 | 67.96 | 50.8 | 15.4 | 30.49 | 17.4 | 15.9 | 18.44 | 23.2 | 15.9 | 36.17 | 53.7 |
| 16.1 | 67.26 | 50.6 | 16.4 | 30.25 | 17.6 | 16.9 | 18.70 | 23.0 | 16.9 | 36.70 | 53.4 |
| 17.1 | 66.54 | 50.5 | 17.4 | 30.00 | 17.9 | 17.8 | 18.96 | 22.8 | 17.9 | 37.21 | 53.2 |
| 18.1 | 65.80 | 50.3 | 18.4 | 29.76 | 18.1 | 18.8 | 19.23 | 22.6 | 18.9 | 37.73 | 52.9 |
| 19.1 | 65.02 | 50.2 | 19.4 | 29.51 | 18.3 | 19.8 | 19.51 | 22.4 | 19.9 | 38.26 | 52.6 |
| 20.1 | 64.19 | 50.0 | 20.4 | 29.25 | 18.6 | 20.8 | 19.80 | 22.2 | 20.9 | 38.84 | 52.3 |
| 21.1 | 63.35 | 49.8 | 21.4 | 28.97 | 18.8 | 21.8 | 20.10 | 22.0 | 21.9 | 39.48 | 52.0 |
| 22.1 | 62.48 | 49.6 | 22.4 | 28.66 | 19.1 | 22.8 | 20.43 | 21.8 | 22.9 | 40.19 | 51.7 |
| 23.1 | 61.62 | 49.4 | 23.4 | 28.31 | 19.3 | 23.8 | 20.79 | 21.6 | 23.9 | 40.98 | 51.5 |
| 24.1 | 60.78 | 49.2 | 24.3 | 27.94 | 19.6 | 24.8 | 21.14 | 21.4 | 24.9 | 41.83 | 51.2 |
| 25.1 | 60.01 | 48.9 | 25.3 | 27.54 | 19.8 | 25.8 | 21.50 | 21.2 | 25.9 | 42.74 | 50.9 |
| 26.1 | 59.30 | 48.7 | 26.3 | 27.14 | 20.0 | 26.8 | 21.87 | 21.1 | 26.9 | 43.66 | 50.7 |
| 27.1 | 58.67 | 48.4 | 27.3 | 26.75 | 20.2 | 27.8 | 22.21 | 21.0 | 27.9 | 44.57 | 50.5 |
| 28.1 | 58.08 | 48.1 | 28.3 | 26.39 | 20.3 | 28.8 | 22.56 | 20.9 | 28.9 | 45.46 | 50.3 |
| 29.1 | 57.53 | 47.9 | 29.3 | 26.03 | 20.4 | 29.8 | 22.87 | 20.8 | 29.9 | 46.29 | 50.1 |

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Ursæ Minoris. (Polaris.) | | Mean Solar Date. | 51 Cephei (HEV.) | | Mean Solar Date. | δ Ursæ Minoris. | | Mean Solar Date. | λ Ursæ Minoris. | |
|------------------------|--------------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|---------------------------------|----------------------------|
| | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. |
| Mar. | ^h 1 ^m 17 | +88° 43' | Mar. | ^h 6 ^m 49 | +87° 13' | Mar. | ^h 18 ^m 7 | +86° 36' | Mar. | ^h 19 ^m 31 | +88° 57' |
| | ^s | " | | ^s | " | | ^s | " | | ^s | " |
| 1.1 | 57.53 | 47.9 | 1.3 | 26.03 | 20.4 | 1.8 | 22.87 | 20.8 | 1.9 | 46.29 | 50.1 |
| 2.1 | 57.01 | 47.7 | 2.3 | 25.70 | 20.6 | 2.8 | 23.19 | 20.7 | 2.9 | 47.08 | 49.9 |
| 3.1 | 56.50 | 47.4 | 3.3 | 25.38 | 20.7 | 3.8 | 23.49 | 20.6 | 3.9 | 47.83 | 49.7 |
| 4.1 | 55.93 | 47.2 | 4.3 | 25.09 | 20.9 | 4.8 | 23.80 | 20.4 | 4.9 | 48.57 | 49.5 |
| 5.1 | 55.35 | 47.0 | 5.3 | 24.77 | 21.1 | 5.8 | 24.11 | 20.3 | 5.9 | 49.31 | 49.3 |
| 6.1 | 54.71 | 46.8 | 6.3 | 24.45 | 21.3 | 6.8 | 24.44 | 20.2 | 6.9 | 50.09 | 49.0 |
| 7.1 | 54.07 | 46.6 | 7.3 | 24.10 | 21.5 | 7.8 | 24.77 | 20.0 | 7.9 | 50.93 | 48.8 |
| 8.1 | 53.41 | 46.3 | 8.3 | 23.73 | 21.6 | 8.8 | 25.13 | 19.9 | 8.9 | 51.86 | 48.5 |
| 9.1 | 52.76 | 46.1 | 9.3 | 23.32 | 21.8 | 9.8 | 25.50 | 19.8 | 9.9 | 52.85 | 48.3 |
| 10.1 | 52.17 | 45.8 | 10.3 | 22.90 | 22.0 | 10.8 | 25.88 | 19.7 | 10.9 | 53.90 | 48.1 |
| 11.1 | 51.63 | 45.5 | 11.3 | 22.47 | 22.1 | 11.8 | 26.27 | 19.6 | 11.9 | 54.98 | 47.9 |
| 12.1 | 51.17 | 45.2 | 12.3 | 22.03 | 22.2 | 12.8 | 26.64 | 19.6 | 12.9 | 56.08 | 47.8 |
| 13.1 | 50.77 | 44.9 | 13.3 | 21.60 | 22.3 | 13.8 | 27.00 | 19.6 | 13.9 | 57.15 | 47.6 |
| 14.1 | 50.44 | 44.6 | 14.3 | 21.18 | 22.4 | 14.8 | 27.35 | 19.6 | 14.9 | 58.19 | 47.5 |
| 15.1 | 50.14 | 44.3 | 15.3 | 20.78 | 22.5 | 15.8 | 27.69 | 19.5 | 15.8 | 59.17 | 47.4 |
| 16.1 | 49.84 | 44.0 | 16.3 | 20.43 | 22.5 | 16.8 | 28.01 | 19.5 | 16.8 | 60.12 | 47.3 |
| 17.1 | 49.52 | 43.8 | 17.3 | 20.07 | 22.6 | 17.8 | 28.33 | 19.5 | 17.8 | 61.04 | 47.1 |
| 18.1 | 49.19 | 43.5 | 18.3 | 19.70 | 22.7 | 18.8 | 28.67 | 19.4 | 18.8 | 61.96 | 47.0 |
| 19.1 | 48.81 | 43.3 | 19.3 | 19.34 | 22.8 | 19.8 | 29.00 | 19.4 | 19.8 | 62.90 | 46.9 |
| 20.1 | 48.39 | 43.0 | 20.3 | 18.96 | 22.9 | 20.8 | 29.36 | 19.3 | 20.8 | 63.89 | 46.7 |
| 21.1 | 47.96 | 42.7 | 21.3 | 18.54 | 23.0 | 21.8 | 29.73 | 19.3 | 21.8 | 64.95 | 46.5 |
| 22.0 | 47.54 | 42.4 | 22.3 | 18.11 | 23.1 | 22.8 | 30.11 | 19.2 | 22.8 | 66.07 | 46.4 |
| 23.0 | 47.13 | 42.1 | 23.3 | 17.66 | 23.2 | 23.8 | 30.52 | 19.2 | 23.8 | 67.25 | 46.2 |
| 24.0 | 46.76 | 41.8 | 24.3 | 17.19 | 23.2 | 24.7 | 30.90 | 19.2 | 24.8 | 68.48 | 46.1 |
| 25.0 | 46.49 | 41.4 | 25.3 | 16.70 | 23.3 | 25.7 | 31.31 | 19.2 | 25.8 | 69.73 | 46.0 |
| 26.0 | 46.27 | 41.1 | 26.3 | 16.22 | 23.3 | 26.7 | 31.68 | 19.3 | 26.8 | 70.95 | 46.0 |
| 27.0 | 46.14 | 40.7 | 27.3 | 15.77 | 23.3 | 27.7 | 32.06 | 19.4 | 27.8 | 72.15 | 45.9 |
| 28.0 | 46.05 | 40.4 | 28.3 | 15.34 | 23.3 | 28.7 | 32.39 | 19.4 | 28.8 | 73.28 | 45.9 |
| 29.0 | 45.98 | 40.1 | 29.3 | 14.92 | 23.3 | 29.7 | 32.73 | 19.5 | 29.8 | 74.37 | 45.8 |
| 30.0 | 45.92 | 39.8 | 30.3 | 14.54 | 23.3 | 30.7 | 33.06 | 19.6 | 30.8 | 75.41 | 45.8 |
| 31.0 | 45.87 | 39.6 | 31.3 | 14.18 | 23.3 | 31.7 | 33.36 | 19.6 | 31.8 | 76.39 | 45.7 |
| 32.0 | 45.77 | 39.3 | 32.3 | 13.82 | 23.3 | 32.7 | 33.68 | 19.7 | 32.8 | 77.38 | 45.7 |

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Ursæ Minoris. (Polaris.) | | Mean Solar Date. | 51 Cephei (Hæv.) | | Mean Solar Date. | δ Ursæ Minoris. | | Mean Solar Date. | λ Ursæ Minoris. | |
|------------------------|--------------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|---------------------------------|----------------------------|
| | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. |
| Apr. | ^h 1 ^m 17 | +88° 43' | Apr. | ^h 6 ^m 49 | +87° 13' | Apr. | ^h 18 ^m 7 | +86° 36' | Apr. | ^h 19 ^m 32 | +88° 57' |
| 1.0 | ^s 45.77 | 39.3 | 1.3 | ^s 13.82 | 23.3 | 1.7 | ^s 33.68 | 19.7 | 1.8 | ^s 17.38 | 45.7 |
| 2.0 | 45.63 | 39.0 | 2.2 | 13.46 | 23.3 | 2.7 | 34.00 | 19.7 | 2.8 | 18.36 | 45.6 |
| 3.0 | 45.48 | 38.8 | 3.2 | 13.08 | 23.3 | 3.7 | 34.33 | 19.7 | 3.8 | 19.40 | 45.5 |
| 4.0 | 45.30 | 38.5 | 4.2 | 12.68 | 23.3 | 4.7 | 34.67 | 19.8 | 4.8 | 20.50 | 45.5 |
| 5.0 | 45.15 | 38.2 | 5.2 | 12.25 | 23.4 | 5.7 | 35.04 | 19.8 | 5.8 | 21.68 | 45.4 |
| 6.0 | 45.01 | 37.8 | 6.2 | 11.81 | 23.4 | 6.7 | 35.40 | 19.9 | 6.8 | 22.86 | 45.3 |
| 7.0 | 44.95 | 37.5 | 7.2 | 11.35 | 23.4 | 7.7 | 35.77 | 20.0 | 7.8 | 24.11 | 45.3 |
| 8.0 | 44.95 | 37.2 | 8.2 | 10.89 | 23.3 | 8.7 | 36.14 | 20.1 | 8.8 | 25.36 | 45.3 |
| 9.0 | 45.03 | 36.8 | 9.2 | 10.44 | 23.2 | 9.7 | 36.48 | 20.3 | 9.8 | 26.59 | 45.3 |
| 10.0 | 45.17 | 36.5 | 10.2 | 10.00 | 23.2 | 10.7 | 36.80 | 20.4 | 10.8 | 27.77 | 45.3 |
| 10.9 | 45.35 | 36.2 | 11.2 | 9.59 | 23.1 | 11.7 | 37.12 | 20.6 | 11.8 | 28.91 | 45.4 |
| 11.9 | 45.56 | 35.9 | 12.2 | 9.22 | 23.0 | 12.7 | 37.41 | 20.7 | 12.8 | 29.97 | 45.4 |
| 12.9 | 45.76 | 35.6 | 13.2 | 8.86 | 22.9 | 13.7 | 37.71 | 20.9 | 13.8 | 31.01 | 45.5 |
| 13.9 | 45.94 | 35.4 | 14.2 | 8.51 | 22.8 | 14.7 | 37.98 | 21.0 | 14.8 | 32.01 | 45.5 |
| 14.9 | 46.07 | 35.1 | 15.2 | 8.17 | 22.7 | 15.7 | 38.28 | 21.1 | 15.8 | 33.02 | 45.5 |
| 15.9 | 46.17 | 34.8 | 16.2 | 7.81 | 22.6 | 16.7 | 38.56 | 21.2 | 16.8 | 34.05 | 45.5 |
| 16.9 | 46.25 | 34.5 | 17.2 | 7.43 | 22.6 | 17.7 | 38.88 | 21.3 | 17.8 | 35.12 | 45.5 |
| 17.9 | 46.32 | 34.3 | 18.2 | 7.05 | 22.5 | 18.7 | 39.20 | 21.4 | 18.8 | 36.27 | 45.5 |
| 18.9 | 46.41 | 33.9 | 19.2 | 6.62 | 22.5 | 19.7 | 39.54 | 21.6 | 19.8 | 37.45 | 45.6 |
| 19.9 | 46.53 | 33.6 | 20.2 | 6.19 | 22.4 | 20.7 | 39.89 | 21.7 | 20.8 | 38.68 | 45.6 |
| 20.9 | 46.72 | 33.3 | 21.2 | 5.75 | 22.3 | 21.7 | 40.21 | 21.9 | 21.7 | 39.93 | 45.6 |
| 21.9 | 46.98 | 33.0 | 22.2 | 5.32 | 22.2 | 22.7 | 40.53 | 22.1 | 22.7 | 41.15 | 45.7 |
| 22.9 | 47.32 | 32.6 | 23.2 | 4.90 | 22.0 | 23.7 | 40.84 | 22.3 | 23.7 | 42.34 | 45.8 |
| 23.9 | 47.77 | 32.3 | 24.2 | 4.52 | 21.8 | 24.7 | 41.12 | 22.6 | 24.7 | 43.47 | 46.0 |
| 24.9 | 48.15 | 32.0 | 25.2 | 4.15 | 21.6 | 25.7 | 41.38 | 22.8 | 25.7 | 44.52 | 46.1 |
| 25.9 | 48.57 | 31.8 | 26.2 | 3.83 | 21.5 | 26.7 | 41.62 | 23.0 | 26.7 | 45.52 | 46.2 |
| 26.9 | 49.01 | 31.5 | 27.2 | 3.52 | 21.3 | 27.7 | 41.85 | 23.2 | 27.7 | 46.46 | 46.3 |
| 27.9 | 49.42 | 31.3 | 28.2 | 3.24 | 21.1 | 28.7 | 42.07 | 23.4 | 28.7 | 47.36 | 46.4 |
| 28.9 | 49.79 | 31.0 | 29.2 | 2.95 | 21.0 | 29.6 | 42.30 | 23.6 | 29.7 | 48.26 | 46.5 |
| 29.9 | 50.12 | 30.8 | 30.2 | 2.66 | 20.9 | 30.6 | 42.54 | 23.8 | 30.7 | 49.17 | 46.6 |
| 30.9 | 50.44 | 30.6 | 31.2 | 2.35 | 20.8 | 31.6 | 42.79 | 24.0 | 31.7 | 50.14 | 46.7 |
| 31.9 | 50.74 | 30.3 | | | | | | | | | |

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Ursæ Minoris. (Polaris.) | | Mean Solar Date. | 51 Cephei (Hev.) | | Mean Solar Date. | δ Ursæ Minoris. | | Mean Solar Date. | λ Ursæ Minoris. | |
|------------------------|--------------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|---------------------------------|----------------------------|
| | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. |
| May | ^h 1 ^m 17 | +88° 43' | May | ^h 6 ^m 48 | +87° 13' | May | ^h 18 ^m 7 | +86° 36' | May | ^h 19 ^m 32 | +88° 57' |
| | ^s | " | | ^s | " | | ^s | " | | ^s | " |
| 1.9 | 50.74 | 30.3 | 1.2 | 62.35 | 20.8 | 1.6 | 42.79 | 24.0 | 1.7 | 50.14 | 46.7 |
| 2.9 | 51.08 | 30.0 | 2.2 | 62.02 | 20.6 | 2.6 | 43.03 | 24.1 | 2.7 | 51.15 | 46.8 |
| 3.9 | 51.47 | 29.8 | 3.2 | 61.67 | 20.5 | 3.6 | 43.29 | 24.3 | 3.7 | 52.22 | 46.9 |
| 4.9 | 51.90 | 29.5 | 4.2 | 61.31 | 20.3 | 4.6 | 43.56 | 24.6 | 4.7 | 53.30 | 47.0 |
| 5.9 | 52.43 | 29.2 | 5.2 | 60.95 | 20.2 | 5.6 | 43.82 | 24.8 | 5.7 | 54.40 | 47.2 |
| 6.9 | 53.01 | 28.9 | 6.1 | 60.60 | 20.0 | 6.6 | 44.07 | 25.1 | 6.7 | 55.47 | 47.3 |
| 7.9 | 53.62 | 28.7 | 7.1 | 60.27 | 19.7 | 7.6 | 44.29 | 25.3 | 7.7 | 56.51 | 47.5 |
| 8.9 | 54.29 | 28.4 | 8.1 | 59.96 | 19.5 | 8.6 | 44.49 | 25.6 | 8.7 | 57.48 | 47.7 |
| 9.9 | 54.95 | 28.2 | 9.1 | 59.67 | 19.3 | 9.6 | 44.68 | 25.9 | 9.7 | 58.37 | 47.9 |
| 10.9 | 55.58 | 28.0 | 10.1 | 59.43 | 19.0 | 10.6 | 44.85 | 26.2 | 10.7 | 59.21 | 48.1 |
| 11.9 | 56.19 | 27.8 | 11.1 | 59.19 | 18.8 | 11.6 | 45.00 | 26.4 | 11.7 | 60.00 | 48.3 |
| 12.9 | 56.75 | 27.6 | 12.1 | 58.98 | 18.6 | 12.6 | 45.18 | 26.7 | 12.7 | 60.77 | 48.5 |
| 13.9 | 57.27 | 27.4 | 13.1 | 58.76 | 18.4 | 13.6 | 45.34 | 26.9 | 13.7 | 61.56 | 48.7 |
| 14.9 | 57.77 | 27.2 | 14.1 | 58.53 | 18.2 | 14.6 | 45.52 | 27.1 | 14.7 | 62.38 | 48.8 |
| 15.9 | 58.28 | 27.0 | 15.1 | 58.27 | 18.0 | 15.6 | 45.70 | 27.4 | 15.7 | 63.23 | 49.0 |
| 16.9 | 58.80 | 26.8 | 16.1 | 58.01 | 17.8 | 16.6 | 45.90 | 27.6 | 16.7 | 64.13 | 49.1 |
| 17.9 | 59.38 | 26.5 | 17.1 | 57.71 | 17.6 | 17.6 | 46.10 | 27.9 | 17.7 | 65.07 | 49.3 |
| 18.9 | 60.02 | 26.3 | 18.1 | 57.41 | 17.4 | 18.6 | 46.29 | 28.1 | 18.7 | 66.03 | 49.5 |
| 19.9 | 60.73 | 26.0 | 19.1 | 57.12 | 17.1 | 19.6 | 46.48 | 28.4 | 19.7 | 66.98 | 49.7 |
| 20.9 | 61.51 | 25.8 | 20.1 | 56.84 | 16.9 | 20.6 | 46.65 | 28.8 | 20.7 | 67.88 | 50.0 |
| 21.9 | 62.33 | 25.6 | 21.1 | 56.59 | 16.6 | 21.6 | 46.80 | 29.1 | 21.7 | 68.73 | 50.2 |
| 22.9 | 63.15 | 25.4 | 22.1 | 56.39 | 16.3 | 22.6 | 46.92 | 29.4 | 22.7 | 69.49 | 50.5 |
| 23.9 | 63.97 | 25.3 | 23.1 | 56.20 | 16.0 | 23.6 | 47.01 | 29.7 | 23.7 | 70.18 | 50.7 |
| 24.9 | 64.78 | 25.1 | 24.1 | 56.04 | 15.8 | 24.6 | 47.10 | 30.0 | 24.7 | 70.80 | 51.0 |
| 25.9 | 65.54 | 25.0 | 25.1 | 55.91 | 15.5 | 25.6 | 47.16 | 30.3 | 25.7 | 71.36 | 51.2 |
| 26.9 | 66.25 | 24.9 | 26.1 | 55.79 | 15.2 | 26.6 | 47.24 | 30.6 | 26.7 | 71.91 | 51.5 |
| 27.9 | 66.94 | 24.7 | 27.1 | 55.65 | 15.0 | 27.6 | 47.32 | 30.8 | 27.6 | 72.46 | 51.7 |
| 28.9 | 67.59 | 24.6 | 28.1 | 55.53 | 14.8 | 28.6 | 47.41 | 31.1 | 28.6 | 73.02 | 51.9 |
| 29.9 | 68.27 | 24.5 | 29.1 | 55.38 | 14.5 | 29.6 | 47.50 | 31.4 | 29.6 | 73.64 | 52.1 |
| 30.9 | 68.98 | 24.3 | 30.1 | 55.22 | 14.3 | 30.6 | 47.61 | 31.6 | 30.6 | 74.30 | 52.3 |
| 31.9 | 69.73 | 24.1 | 31.1 | 55.03 | 14.1 | 31.6 | 47.72 | 31.9 | 31.6 | 74.99 | 52.6 |
| 32.9 | 70.55 | 23.9 | 32.1 | 54.85 | 13.8 | 32.6 | 47.82 | 32.2 | 32.6 | 75.70 | 52.8 |

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Ursæ Minoris. (Polaris.) | | Mean Solar Date. | 51 Cephei (HEV.) | | Mean Solar Date. | δ Ursæ Minoris. | | Mean Solar Date. | λ Ursæ Minoris. | |
|------------------------|--------------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|---------------------------------|----------------------------|
| | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. |
| June | ^h 1 ^m 18 | +88° 43' | June | ^h 6 ^m 48 | +87° 13' | June | ^h 18 ^m 7 | +86° 36' | June | ^h 19 ^m 33 | +88° 57' |
| | ^s | " | | ^s | " | | ^s | " | | ^s | " |
| 1.9 | 10.55 | 23.9 | 1.1 | 54.85 | 13.8 | 1.6 | 47.82 | 32.2 | 1.6 | 15.70 | 52.8 |
| 2.8 | 11.43 | 23.8 | 2.1 | 54.66 | 13.5 | 2.6 | 47.91 | 32.6 | 2.6 | 16.39 | 53.1 |
| 3.8 | 12.36 | 23.6 | 3.1 | 54.52 | 13.2 | 3.6 | 47.98 | 32.9 | 3.6 | 17.02 | 53.4 |
| 4.8 | 13.32 | 23.5 | 4.1 | 54.38 | 12.9 | 4.6 | 48.03 | 33.3 | 4.6 | 17.61 | 53.7 |
| 5.8 | 14.29 | 23.4 | 5.1 | 54.27 | 12.5 | 5.5 | 48.05 | 33.6 | 5.6 | 18.11 | 54.0 |
| 6.8 | 15.24 | 23.3 | 6.1 | 54.21 | 12.2 | 6.5 | 48.06 | 33.9 | 6.6 | 18.53 | 54.3 |
| 7.8 | 16.14 | 23.3 | 7.1 | 54.16 | 11.9 | 7.5 | 48.06 | 34.3 | 7.6 | 18.91 | 54.6 |
| 8.8 | 17.01 | 23.2 | 8.1 | 54.13 | 11.6 | 8.5 | 48.04 | 34.6 | 8.6 | 19.24 | 54.9 |
| 9.8 | 17.83 | 23.1 | 9.1 | 54.11 | 11.3 | 9.5 | 48.05 | 34.8 | 9.6 | 19.58 | 55.2 |
| 10.8 | 18.60 | 23.1 | 10.1 | 54.07 | 11.1 | 10.5 | 48.04 | 35.1 | 10.6 | 19.92 | 55.4 |
| 11.8 | 19.37 | 23.0 | 11.1 | 54.02 | 10.8 | 11.5 | 48.06 | 35.4 | 11.6 | 20.29 | 55.7 |
| 12.8 | 20.16 | 22.9 | 12.1 | 53.97 | 10.5 | 12.5 | 48.07 | 35.7 | 12.6 | 20.70 | 55.9 |
| 13.8 | 20.96 | 22.8 | 13.1 | 53.88 | 10.3 | 13.5 | 48.10 | 36.0 | 13.6 | 21.15 | 56.2 |
| 14.8 | 21.83 | 22.7 | 14.1 | 53.79 | 10.0 | 14.5 | 48.14 | 36.3 | 14.6 | 21.62 | 56.5 |
| 15.8 | 22.75 | 22.6 | 15.1 | 53.68 | 9.7 | 15.5 | 48.15 | 36.6 | 15.6 | 22.10 | 56.8 |
| 16.8 | 23.73 | 22.5 | 16.1 | 53.60 | 9.4 | 16.5 | 48.15 | 37.0 | 16.6 | 22.54 | 57.1 |
| 17.8 | 24.76 | 22.4 | 17.0 | 53.55 | 9.0 | 17.5 | 48.13 | 37.3 | 17.6 | 22.92 | 57.4 |
| 18.8 | 25.81 | 22.4 | 18.0 | 53.53 | 8.7 | 18.5 | 48.09 | 37.7 | 18.6 | 23.23 | 57.8 |
| 19.8 | 26.85 | 22.3 | 19.0 | 53.53 | 8.4 | 19.5 | 48.03 | 38.0 | 19.6 | 23.46 | 58.1 |
| 20.8 | 27.86 | 22.3 | 20.0 | 53.58 | 8.0 | 20.5 | 47.94 | 38.3 | 20.6 | 23.62 | 58.4 |
| 21.8 | 28.86 | 22.3 | 21.0 | 53.64 | 7.7 | 21.5 | 47.86 | 38.7 | 21.6 | 23.70 | 58.8 |
| 22.8 | 29.78 | 22.4 | 22.0 | 53.73 | 7.4 | 22.5 | 47.74 | 38.9 | 22.6 | 23.74 | 59.1 |
| 23.8 | 30.65 | 22.4 | 23.0 | 53.84 | 7.1 | 23.5 | 47.65 | 39.2 | 23.6 | 23.77 | 59.4 |
| 24.8 | 31.50 | 22.4 | 24.0 | 53.89 | 6.9 | 24.5 | 47.56 | 39.5 | 24.6 | 23.81 | 59.7 |
| 25.8 | 32.34 | 22.4 | 25.0 | 53.97 | 6.6 | 25.5 | 47.48 | 39.8 | 25.6 | 23.90 | 59.9 |
| 26.8 | 33.19 | 22.4 | 26.0 | 54.03 | 6.3 | 26.5 | 47.39 | 40.0 | 26.6 | 24.01 | 60.2 |
| 27.8 | 34.10 | 22.4 | 27.0 | 54.04 | 6.0 | 27.5 | 47.33 | 40.3 | 27.6 | 24.17 | 60.5 |
| 28.8 | 35.04 | 22.3 | 28.0 | 54.08 | 5.7 | 28.5 | 47.25 | 40.6 | 28.6 | 24.34 | 60.8 |
| 29.8 | 36.05 | 22.3 | 29.0 | 54.11 | 5.4 | 29.5 | 47.17 | 41.0 | 29.6 | 24.50 | 61.1 |
| 30.8 | 37.10 | 22.3 | 30.0 | 54.16 | 5.1 | 30.5 | 47.06 | 41.3 | 30.6 | 24.62 | 61.5 |
| 31.8 | 38.18 | 22.3 | 31.0 | 54.22 | 4.8 | 31.5 | 46.94 | 41.7 | 31.6 | 24.70 | 61.8 |

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Ursæ Minoris. (Polaris.) | | Mean Solar Date. | 51 Cephei (Hæv.) | | Mean Solar Date. | δ Ursæ Minoris. | | Mean Solar Date. | λ Ursæ Minoris. | |
|------------------------|--------------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|---------------------------------|----------------------------|
| | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. |
| July | ^h 1 ^m 18 | +88° 43' | July | ^h 6 ^m 48 | +87° 12' | July | ^h 18 ^m 7 | +86° 36' | July | ^h 19 ^m 33 | +88° 58' |
| | ^s | " | | ^s | " | | ^s | " | | ^s | " |
| 1.8 | 38.18 | 22.3 | 1.0 | 54.22 | 64.8 | 1.5 | 46.94 | 41.7 | 1.6 | 24.70 | 1.8 |
| 2.8 | 39.28 | 22.4 | 2.0 | 54.33 | 64.5 | 2.5 | 46.80 | 42.0 | 2.5 | 24.69 | 2.2 |
| 3.8 | 40.35 | 22.4 | 2.9 | 54.46 | 64.1 | 3.5 | 46.64 | 42.3 | 3.5 | 24.60 | 2.5 |
| 4.8 | 41.38 | 22.5 | 3.9 | 54.62 | 63.8 | 4.5 | 46.46 | 42.6 | 4.5 | 24.45 | 2.9 |
| 5.8 | 42.36 | 22.6 | 4.9 | 54.79 | 63.4 | 5.5 | 46.28 | 42.9 | 5.5 | 24.26 | 3.2 |
| 6.8 | 43.30 | 22.7 | 5.9 | 54.98 | 63.1 | 6.5 | 46.11 | 43.2 | 6.5 | 24.03 | 3.6 |
| 7.8 | 44.17 | 22.8 | 6.9 | 55.17 | 62.9 | 7.5 | 45.94 | 43.5 | 7.5 | 23.83 | 3.9 |
| 8.7 | 45.02 | 22.8 | 7.9 | 55.34 | 62.6 | 8.5 | 45.76 | 43.7 | 8.5 | 23.65 | 4.2 |
| 9.7 | 45.86 | 22.9 | 8.9 | 55.48 | 62.3 | 9.5 | 45.61 | 44.0 | 9.5 | 23.50 | 4.5 |
| 10.7 | 46.73 | 22.9 | 9.9 | 55.62 | 62.1 | 10.5 | 45.46 | 44.3 | 10.5 | 23.39 | 4.7 |
| 11.7 | 47.62 | 23.0 | 10.9 | 55.74 | 61.8 | 11.4 | 45.33 | 44.5 | 11.5 | 23.30 | 5.0 |
| 12.7 | 48.58 | 23.0 | 11.9 | 55.85 | 61.5 | 12.4 | 45.19 | 44.8 | 12.5 | 23.24 | 5.4 |
| 13.7 | 49.59 | 23.1 | 12.9 | 55.96 | 61.2 | 13.4 | 45.03 | 45.1 | 13.5 | 23.15 | 5.7 |
| 14.7 | 50.64 | 23.1 | 13.9 | 56.10 | 60.9 | 14.4 | 44.86 | 45.4 | 14.5 | 23.01 | 6.1 |
| 15.7 | 51.70 | 23.2 | 14.9 | 56.27 | 60.6 | 15.4 | 44.66 | 45.8 | 15.5 | 22.80 | 6.4 |
| 16.7 | 52.78 | 23.3 | 15.9 | 56.47 | 60.2 | 16.4 | 44.43 | 46.1 | 16.5 | 22.51 | 6.8 |
| 17.7 | 53.83 | 23.5 | 16.9 | 56.71 | 59.9 | 17.4 | 44.20 | 46.4 | 17.5 | 22.13 | 7.1 |
| 18.7 | 54.85 | 23.6 | 17.9 | 56.97 | 59.6 | 18.4 | 43.94 | 46.7 | 18.5 | 21.69 | 7.5 |
| 19.7 | 55.80 | 23.8 | 18.9 | 57.26 | 59.3 | 19.4 | 43.68 | 46.9 | 19.5 | 21.19 | 7.8 |
| 20.7 | 56.69 | 24.0 | 19.9 | 57.55 | 59.0 | 20.4 | 43.41 | 47.2 | 20.5 | 20.67 | 8.1 |
| 21.7 | 57.55 | 24.1 | 20.9 | 57.83 | 58.7 | 21.4 | 43.15 | 47.4 | 21.5 | 20.14 | 8.4 |
| 22.7 | 58.37 | 24.3 | 21.9 | 58.10 | 58.5 | 22.4 | 42.91 | 47.6 | 22.5 | 19.66 | 8.7 |
| 23.7 | 59.20 | 24.4 | 22.9 | 58.37 | 58.2 | 23.4 | 42.66 | 47.9 | 23.5 | 19.21 | 9.0 |
| 24.7 | 60.05 | 24.5 | 23.9 | 58.60 | 58.0 | 24.4 | 42.43 | 48.1 | 24.5 | 18.80 | 9.3 |
| 25.7 | 60.95 | 24.7 | 24.9 | 58.83 | 57.7 | 25.4 | 42.19 | 48.3 | 25.5 | 18.41 | 9.6 |
| 26.7 | 61.89 | 24.8 | 25.9 | 59.06 | 57.4 | 26.4 | 41.97 | 48.6 | 26.5 | 18.04 | 9.9 |
| 27.7 | 62.89 | 24.9 | 26.9 | 59.27 | 57.1 | 27.4 | 41.71 | 48.9 | 27.5 | 17.64 | 10.2 |
| 28.7 | 63.91 | 25.1 | 27.9 | 59.54 | 56.8 | 28.4 | 41.46 | 49.2 | 28.5 | 17.18 | 10.6 |
| 29.7 | 64.95 | 25.3 | 28.9 | 59.82 | 56.5 | 29.4 | 41.17 | 49.4 | 29.5 | 16.66 | 10.9 |
| 30.7 | 65.98 | 25.5 | 29.9 | 60.12 | 56.2 | 30.4 | 40.87 | 49.7 | 30.5 | 16.06 | 11.3 |
| 31.7 | 66.98 | 25.7 | 30.9 | 60.48 | 55.9 | 31.4 | 40.55 | 50.0 | 31.5 | 15.40 | 11.6 |
| 32.7 | 67.91 | 25.9 | 31.9 | 60.83 | 55.6 | 32.4 | 40.21 | 50.2 | 32.5 | 14.67 | 11.9 |
| | | | 32.9 | 61.20 | 55.4 | | | | | | |

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | <i>α</i> Ursæ Minoris. (Polaris.) | | Mean Solar Date. | 51 Cephei (Hæv.) | | Mean Solar Date. | <i>δ</i> Ursæ Minoris. | | Mean Solar Date. | <i>λ</i> Ursæ Minoris. | |
|------------------------|--------------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|---------------------------------|----------------------------|
| | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. |
| Aug. | ^h 1 ^m 19 | +88° 43' | Aug. | ^h 6 ^m 49 | +87° 12' | Aug. | ^h 18 ^m 7 | +86° 36' | Aug. | ^h 19 ^m 32 | +88° 58' |
| 1.7 | ^s 7.91 | 25.9 | 1.9 | ^s 1.20 | 55.4 | 1.4 | ^s 40.21 | 50.2 | 1.5 | ^s 74.67 | 11.0 |
| 2.7 | 8.79 | 26.1 | 2.9 | 1.57 | 55.1 | 2.4 | 39.89 | 50.4 | 2.5 | 73.92 | 12.2 |
| 3.7 | 9.60 | 26.3 | 3.9 | 1.93 | 54.9 | 3.4 | 39.56 | 50.6 | 3.5 | 73.17 | 12.5 |
| 4.7 | 10.36 | 26.5 | 4.9 | 2.26 | 54.7 | 4.4 | 39.25 | 50.8 | 4.5 | 72.45 | 12.8 |
| 5.7 | 11.12 | 26.8 | 5.9 | 2.59 | 54.5 | 5.4 | 38.96 | 51.0 | 5.5 | 71.75 | 13.1 |
| 6.7 | 11.88 | 27.0 | 6.9 | 2.91 | 54.2 | 6.4 | 38.66 | 51.2 | 6.5 | 71.10 | 13.3 |
| 7.7 | 12.65 | 27.1 | 7.9 | 3.21 | 54.0 | 7.4 | 38.39 | 51.4 | 7.5 | 70.49 | 13.6 |
| 8.7 | 13.47 | 27.3 | 8.9 | 3.50 | 53.8 | 8.4 | 38.11 | 51.6 | 8.4 | 69.90 | 13.9 |
| 9.7 | 14.35 | 27.5 | 9.9 | 3.81 | 53.5 | 9.4 | 37.82 | 51.8 | 9.4 | 69.30 | 14.2 |
| 10.7 | 15.26 | 27.7 | 10.9 | 4.14 | 53.2 | 10.4 | 37.52 | 52.0 | 10.4 | 68.66 | 14.5 |
| 11.7 | 16.21 | 27.9 | 11.9 | 4.51 | 52.9 | 11.4 | 37.20 | 52.3 | 11.4 | 67.96 | 14.8 |
| 12.7 | 17.16 | 28.1 | 12.9 | 4.89 | 52.7 | 12.4 | 36.85 | 52.5 | 12.4 | 67.19 | 15.2 |
| 13.7 | 18.07 | 28.4 | 13.9 | 5.32 | 52.4 | 13.4 | 36.49 | 52.7 | 13.4 | 66.34 | 15.5 |
| 14.6 | 18.97 | 28.7 | 14.9 | 5.75 | 52.1 | 14.4 | 36.11 | 52.9 | 14.4 | 65.43 | 15.8 |
| 15.6 | 19.80 | 29.0 | 15.9 | 6.22 | 51.9 | 15.4 | 35.71 | 53.1 | 15.4 | 64.45 | 16.1 |
| 16.6 | 20.56 | 29.3 | 16.9 | 6.67 | 51.7 | 16.4 | 35.32 | 53.2 | 16.4 | 63.44 | 16.4 |
| 17.6 | 21.27 | 29.6 | 17.9 | 7.12 | 51.5 | 17.4 | 34.94 | 53.4 | 17.4 | 62.41 | 16.6 |
| 18.6 | 21.95 | 29.9 | 18.9 | 7.53 | 51.4 | 18.4 | 34.56 | 53.5 | 18.4 | 61.42 | 16.9 |
| 19.6 | 22.60 | 30.1 | 19.9 | 7.94 | 51.2 | 19.3 | 34.19 | 53.6 | 19.4 | 60.47 | 17.1 |
| 20.6 | 23.27 | 30.4 | 20.9 | 8.32 | 51.0 | 20.3 | 33.84 | 53.8 | 20.4 | 59.59 | 17.3 |
| 21.6 | 23.97 | 30.6 | 21.9 | 8.70 | 50.8 | 21.3 | 33.51 | 53.9 | 21.4 | 58.69 | 17.6 |
| 22.6 | 24.71 | 30.9 | 22.8 | 9.08 | 50.6 | 22.3 | 33.15 | 54.1 | 22.4 | 57.84 | 17.8 |
| 23.6 | 25.49 | 31.1 | 23.8 | 9.47 | 50.4 | 23.3 | 32.81 | 54.2 | 23.4 | 56.97 | 18.1 |
| 24.6 | 26.31 | 31.4 | 24.8 | 9.88 | 50.2 | 24.3 | 32.42 | 54.4 | 24.4 | 56.08 | 18.4 |
| 25.6 | 27.14 | 31.7 | 25.8 | 10.33 | 49.9 | 25.3 | 32.05 | 54.6 | 25.4 | 55.12 | 18.7 |
| 26.6 | 27.98 | 32.0 | 26.8 | 10.80 | 49.7 | 26.3 | 31.64 | 54.8 | 26.4 | 54.11 | 19.0 |
| 27.6 | 28.78 | 32.3 | 27.8 | 11.31 | 49.5 | 27.3 | 31.22 | 55.0 | 27.4 | 53.00 | 19.2 |
| 28.6 | 29.51 | 32.6 | 28.8 | 11.81 | 49.3 | 28.3 | 30.80 | 55.1 | 28.4 | 51.85 | 19.5 |
| 29.6 | 30.19 | 32.9 | 29.8 | 12.32 | 49.1 | 29.3 | 30.36 | 55.2 | 29.4 | 50.67 | 19.8 |
| 30.6 | 30.80 | 33.3 | 30.8 | 12.83 | 49.0 | 30.3 | 29.94 | 55.3 | 30.4 | 49.47 | 20.0 |
| 31.6 | 31.35 | 33.6 | 31.8 | 13.31 | 48.9 | 31.3 | 29.52 | 55.4 | 31.4 | 48.30 | 20.2 |
| 32.6 | 31.88 | 33.9 | 32.8 | 13.77 | 48.7 | 32.3 | 29.12 | 55.5 | 32.4 | 47.15 | 20.4 |

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Ursæ Minoris. (Polaris.) | | Mean Solar Date. | 51 Cephei (Hæv.) | | Mean Solar Date. | δ Ursæ Minoris. | | Mean Solar Date. | λ Ursæ Minoris. | |
|------------------------|--------------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|---------------------------------|----------------------------|
| | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. |
| Sept. | ^h 1 ^m 19 | +88° 43' | Sept. | ^h 6 ^m 49 | +87° 12' | Sept. | ^h 18 ^m 7 | +86° 36' | Sept. | ^h 19 ^m 32 | +88° 58' |
| | ^s | " | | ^s | " | | ^s | " | | ^s | " |
| 1.6 | 31.88 | 33.9 | 1.8 | 13.77 | 48.7 | 1.3 | 29.12 | 55.5 | 1.4 | 47.15 | 20.4 |
| 2.6 | 32.39 | 34.2 | 2.8 | 14.22 | 48.6 | 2.3 | 28.74 | 55.5 | 2.4 | 46.07 | 20.6 |
| 3.6 | 32.90 | 34.5 | 3.8 | 14.65 | 48.5 | 3.3 | 28.36 | 55.6 | 3.4 | 45.02 | 20.8 |
| 4.6 | 33.46 | 34.8 | 4.8 | 15.06 | 48.3 | 4.3 | 27.99 | 55.7 | 4.4 | 44.00 | 21.0 |
| 5.6 | 34.06 | 35.1 | 5.8 | 15.50 | 48.2 | 5.3 | 27.62 | 55.8 | 5.4 | 42.99 | 21.2 |
| 6.6 | 34.70 | 35.4 | 6.8 | 15.94 | 48.0 | 6.3 | 27.24 | 55.9 | 6.4 | 41.96 | 21.4 |
| 7.6 | 35.38 | 35.7 | 7.8 | 16.41 | 47.8 | 7.3 | 26.86 | 56.0 | 7.4 | 40.89 | 21.7 |
| 8.6 | 36.07 | 36.0 | 8.8 | 16.91 | 47.6 | 8.3 | 26.44 | 56.1 | 8.4 | 39.74 | 21.9 |
| 9.6 | 36.73 | 36.4 | 9.8 | 17.43 | 47.5 | 9.3 | 26.01 | 56.2 | 9.4 | 38.53 | 22.1 |
| 10.6 | 37.36 | 36.7 | 10.8 | 17.98 | 47.3 | 10.3 | 25.56 | 56.3 | 10.4 | 37.26 | 22.4 |
| 11.6 | 37.95 | 37.1 | 11.8 | 18.55 | 47.2 | 11.3 | 25.11 | 56.4 | 11.4 | 35.90 | 22.6 |
| 12.6 | 38.46 | 37.5 | 12.8 | 19.11 | 47.1 | 12.3 | 24.64 | 56.4 | 12.4 | 34.53 | 22.8 |
| 13.6 | 38.91 | 37.9 | 13.8 | 19.66 | 47.0 | 13.3 | 24.18 | 56.5 | 13.4 | 33.15 | 23.0 |
| 14.6 | 39.31 | 38.3 | 14.8 | 20.20 | 46.9 | 14.3 | 23.74 | 56.5 | 14.4 | 31.77 | 23.1 |
| 15.6 | 39.67 | 38.6 | 15.8 | 20.71 | 46.8 | 15.3 | 23.32 | 56.5 | 15.4 | 30.46 | 23.3 |
| 16.6 | 40.04 | 39.0 | 16.3 | 21.20 | 46.8 | 16.3 | 22.89 | 56.5 | 16.4 | 29.17 | 23.4 |
| 17.6 | 40.43 | 39.3 | 17.8 | 21.68 | 46.7 | 17.3 | 22.48 | 56.5 | 17.3 | 27.94 | 23.5 |
| 18.6 | 40.84 | 39.6 | 18.8 | 22.15 | 46.6 | 18.3 | 22.08 | 56.5 | 18.3 | 26.73 | 23.7 |
| 19.6 | 41.31 | 40.0 | 19.8 | 22.64 | 46.5 | 19.3 | 21.69 | 56.6 | 19.3 | 25.54 | 23.8 |
| 20.5 | 41.80 | 40.3 | 20.8 | 23.13 | 46.4 | 20.3 | 21.27 | 56.6 | 20.3 | 24.34 | 24.0 |
| 21.5 | 42.32 | 40.7 | 21.8 | 23.65 | 46.2 | 21.3 | 20.85 | 56.7 | 21.3 | 23.10 | 24.2 |
| 22.5 | 42.83 | 41.0 | 22.8 | 24.18 | 46.1 | 22.3 | 20.40 | 56.7 | 22.3 | 21.78 | 24.4 |
| 23.5 | 43.34 | 41.4 | 23.8 | 24.76 | 46.0 | 23.2 | 19.95 | 56.8 | 23.3 | 20.41 | 24.6 |
| 24.5 | 43.78 | 41.8 | 24.8 | 25.33 | 45.9 | 24.2 | 19.47 | 56.8 | 24.3 | 18.97 | 24.8 |
| 25.5 | 44.15 | 42.2 | 25.8 | 25.91 | 45.9 | 25.2 | 19.00 | 56.8 | 25.3 | 17.50 | 24.9 |
| 26.5 | 44.45 | 42.6 | 26.8 | 26.50 | 45.8 | 26.2 | 18.55 | 56.8 | 26.3 | 16.01 | 25.0 |
| 27.5 | 44.70 | 43.0 | 27.7 | 27.06 | 45.8 | 27.2 | 18.10 | 56.7 | 27.3 | 14.54 | 25.1 |
| 28.5 | 44.89 | 43.4 | 28.7 | 27.59 | 45.8 | 28.2 | 17.65 | 56.6 | 28.3 | 13.11 | 25.2 |
| 29.5 | 45.06 | 43.8 | 29.7 | 28.12 | 45.8 | 29.2 | 17.23 | 56.6 | 29.3 | 11.74 | 25.3 |
| 30.5 | 45.23 | 44.1 | 30.7 | 28.61 | 45.8 | 30.2 | 16.82 | 56.5 | 30.3 | 10.41 | 25.4 |
| 31.5 | 45.42 | 44.5 | 31.7 | 29.08 | 45.7 | 31.2 | 16.44 | 56.5 | 31.3 | 9.12 | 25.5 |

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Ursæ Minoris. (Polaris.) | | Mean Solar Date. | 51 Cephei (Hæv.) | | Mean Solar Date. | δ Ursæ Minoris. | | Mean Solar Date. | λ Ursæ Minoris. | |
|------------------------|--------------------------------------|----------------------------|------------------------|-----------------------------------|----------------------------|------------------------|-----------------------------------|----------------------------|------------------------|------------------------------------|----------------------------|
| | Right Ascension. | Declina- tion North. | | Right Ascension. | Declina- tion North. | | Right Ascension. | Declina- tion North. | | Right Ascension. | Declina- tion North. |
| Oct. | ^h ^m 1 19 | +88° 43' | Oct. | ^h ^m 6 49 | +87° 12' | Oct. | ^h ^m 18 7 | +86° 36' | Oct. | ^h ^m 19 31 | +88° 58' |
| 1.5 | ^s 45.42 | 44.5 | 1.7 | ^s 29.08 | 45.7 | 1.2 | ^s 16.44 | 56.5 | 1.3 | ^s 69.12 | 25.5 |
| 2.5 | 45.65 | 44.8 | 2.7 | 29.56 | 45.7 | 2.2 | 16.03 | 56.4 | 2.3 | 67.87 | 25.6 |
| 3.5 | 45.92 | 45.2 | 3.7 | 30.04 | 45.7 | 3.2 | 15.64 | 56.4 | 3.3 | 66.62 | 25.7 |
| 4.5 | 46.23 | 45.5 | 4.7 | 30.56 | 45.6 | 4.2 | 15.23 | 56.4 | 4.3 | 65.32 | 25.8 |
| 5.5 | 46.56 | 45.9 | 5.7 | 31.10 | 45.6 | 5.2 | 14.82 | 56.4 | 5.3 | 63.99 | 25.9 |
| 6.5 | 46.88 | 46.3 | 6.7 | 31.65 | 45.5 | 6.2 | 14.38 | 56.4 | 6.3 | 62.60 | 26.0 |
| 7.5 | 47.15 | 46.7 | 7.7 | 32.23 | 45.5 | 7.2 | 13.92 | 56.3 | 7.3 | 61.13 | 26.1 |
| 8.5 | 47.38 | 47.1 | 8.7 | 32.83 | 45.4 | 8.2 | 13.47 | 56.3 | 8.3 | 59.61 | 26.2 |
| 9.5 | 47.56 | 47.5 | 9.7 | 33.44 | 45.5 | 9.2 | 12.98 | 56.2 | 9.3 | 58.06 | 26.3 |
| 10.5 | 47.66 | 48.0 | 10.7 | 34.02 | 45.5 | 10.2 | 12.53 | 56.1 | 10.3 | 56.48 | 26.4 |
| 11.5 | 47.69 | 48.4 | 11.7 | 34.60 | 45.5 | 11.2 | 12.09 | 56.0 | 11.3 | 54.93 | 26.4 |
| 12.5 | 47.69 | 48.8 | 12.7 | 35.15 | 45.6 | 12.2 | 11.65 | 55.8 | 12.3 | 53.40 | 26.4 |
| 13.5 | 47.67 | 49.2 | 13.7 | 35.67 | 45.6 | 13.2 | 11.23 | 55.7 | 13.3 | 51.95 | 26.4 |
| 14.5 | 47.67 | 49.5 | 14.7 | 36.16 | 45.7 | 14.2 | 10.85 | 55.6 | 14.3 | 50.54 | 26.4 |
| 15.5 | 47.68 | 49.9 | 15.7 | 36.67 | 45.7 | 15.2 | 10.45 | 55.5 | 15.3 | 49.19 | 26.5 |
| 16.5 | 47.73 | 50.2 | 16.7 | 37.16 | 45.8 | 16.2 | 10.07 | 55.4 | 16.3 | 47.86 | 26.5 |
| 17.5 | 47.82 | 50.6 | 17.7 | 37.65 | 45.8 | 17.2 | 9.68 | 55.3 | 17.3 | 46.53 | 26.5 |
| 18.5 | 47.94 | 51.0 | 18.7 | 38.19 | 45.8 | 18.2 | 9.28 | 55.2 | 18.3 | 45.17 | 26.6 |
| 19.5 | 48.07 | 51.4 | 19.7 | 38.72 | 45.8 | 19.2 | 8.86 | 55.1 | 19.3 | 43.77 | 26.6 |
| 20.5 | 48.17 | 51.8 | 20.7 | 39.28 | 45.8 | 20.2 | 8.43 | 55.0 | 20.2 | 42.32 | 26.7 |
| 21.5 | 48.25 | 52.2 | 21.7 | 39.88 | 45.9 | 21.2 | 8.00 | 54.9 | 21.2 | 40.81 | 26.7 |
| 22.5 | 48.23 | 52.6 | 22.7 | 40.45 | 45.9 | 22.2 | 7.56 | 54.8 | 22.2 | 39.26 | 26.8 |
| 23.5 | 48.17 | 53.0 | 23.7 | 41.02 | 46.0 | 23.2 | 7.12 | 54.6 | 23.2 | 37.69 | 26.8 |
| 24.5 | 48.04 | 53.4 | 24.7 | 41.60 | 46.1 | 24.2 | 6.71 | 54.4 | 24.2 | 36.14 | 26.8 |
| 25.5 | 47.82 | 53.8 | 25.7 | 42.13 | 46.2 | 25.2 | 6.30 | 54.2 | 25.2 | 34.63 | 26.7 |
| 26.4 | 47.60 | 54.2 | 26.7 | 42.64 | 46.3 | 26.2 | 5.91 | 54.0 | 26.2 | 33.17 | 26.7 |
| 27.4 | 47.36 | 54.6 | 27.7 | 43.13 | 46.4 | 27.2 | 5.54 | 53.8 | 27.2 | 31.77 | 26.6 |
| 28.4 | 47.13 | 54.9 | 28.7 | 43.60 | 46.6 | 28.2 | 5.19 | 53.7 | 28.2 | 30.43 | 26.5 |
| 29.4 | 46.94 | 55.3 | 29.7 | 44.05 | 46.7 | 29.2 | 4.86 | 53.5 | 29.2 | 29.13 | 26.5 |
| 30.4 | 46.78 | 55.6 | 30.7 | 44.50 | 46.7 | 30.1 | 4.51 | 53.3 | 30.2 | 27.87 | 26.4 |
| 31.4 | 46.66 | 56.0 | 31.7 | 44.97 | 46.8 | 31.1 | 4.18 | 53.2 | 31.2 | 26.58 | 26.4 |
| 32.4 | 46.56 | 56.3 | 32.7 | 45.47 | 46.9 | 32.1 | 3.81 | 53.0 | 32.2 | 25.27 | 26.4 |

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | <i>α</i> Ursæ Minoris. (<i>Polaris</i> .) | | Mean Solar Date. | 51 Cephei (Hæv.) | | Mean Solar Date. | <i>δ</i> Ursæ Minoris. | | Mean Solar Date. | <i>λ</i> Ursæ Minoris. | |
|------------------------|---|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|--------------------------------|----------------------------|------------------------|---------------------------------|----------------------------|
| | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. |
| Nov. | ^h 1 ^m 19 | +88° 43' | Nov. | ^h 6 ^m 49 | +87° 12' | Nov. | ^h 18 ^m 6 | +86° 36' | Nov. | ^h 19 ^m 30 | +88° 58' |
| | ^s | " | | ^s | " | | ^s | " | | ^s | " |
| 1.4 | 46.56 | 56.3 | 1.7 | 45.47 | 46.9 | 1.1 | 63.81 | 53.0 | 1.2 | 85.27 | 26.4 |
| 2.4 | 46.46 | 56.7 | 2.7 | 45.99 | 47.0 | 2.1 | 63.44 | 52.9 | 2.2 | 83.90 | 26.4 |
| 3.4 | 46.34 | 57.1 | 3.7 | 46.51 | 47.1 | 3.1 | 63.05 | 52.7 | 3.2 | 82.48 | 26.3 |
| 4.4 | 46.18 | 57.5 | 4.7 | 47.06 | 47.2 | 4.1 | 62.66 | 52.5 | 4.2 | 81.01 | 26.3 |
| 5.4 | 45.97 | 57.9 | 5.7 | 47.62 | 47.3 | 5.1 | 62.28 | 52.3 | 5.2 | 79.51 | 26.3 |
| 6.4 | 45.66 | 58.3 | 6.6 | 48.17 | 47.5 | 6.1 | 61.87 | 52.1 | 6.2 | 77.98 | 26.2 |
| 7.4 | 45.30 | 58.7 | 7.6 | 48.69 | 47.6 | 7.1 | 61.50 | 51.8 | 7.2 | 76.48 | 26.1 |
| 8.4 | 44.90 | 59.1 | 8.6 | 49.20 | 47.8 | 8.1 | 61.14 | 51.6 | 8.2 | 75.01 | 26.0 |
| 9.4 | 44.45 | 59.4 | 9.6 | 49.67 | 48.0 | 9.1 | 60.81 | 51.3 | 9.2 | 73.60 | 25.8 |
| 10.4 | 44.02 | 59.8 | 10.6 | 50.12 | 48.2 | 10.1 | 60.47 | 51.0 | 10.2 | 72.26 | 25.7 |
| 11.4 | 43.59 | 60.1 | 11.6 | 50.54 | 48.4 | 11.1 | 60.17 | 50.8 | 11.2 | 70.98 | 25.6 |
| 12.4 | 43.20 | 60.4 | 12.6 | 50.96 | 48.6 | 12.1 | 59.87 | 50.6 | 12.2 | 69.75 | 25.4 |
| 13.4 | 42.86 | 60.7 | 13.6 | 51.40 | 48.7 | 13.1 | 59.57 | 50.3 | 13.2 | 68.54 | 25.3 |
| 14.4 | 42.54 | 61.1 | 14.6 | 51.84 | 48.9 | 14.1 | 59.27 | 50.1 | 14.2 | 67.30 | 25.2 |
| 15.4 | 42.24 | 61.4 | 15.6 | 52.30 | 49.0 | 15.1 | 58.95 | 49.9 | 15.2 | 66.05 | 25.1 |
| 16.4 | 41.93 | 61.7 | 16.6 | 52.77 | 49.2 | 16.1 | 58.63 | 49.7 | 16.2 | 64.74 | 25.0 |
| 17.4 | 41.59 | 62.1 | 17.6 | 53.27 | 49.3 | 17.1 | 58.30 | 49.5 | 17.2 | 63.41 | 24.9 |
| 18.4 | 41.20 | 62.5 | 18.6 | 53.75 | 49.5 | 18.1 | 57.95 | 49.2 | 18.2 | 62.01 | 24.8 |
| 19.4 | 40.73 | 62.8 | 19.6 | 54.25 | 49.7 | 19.1 | 57.64 | 49.0 | 19.2 | 60.62 | 24.7 |
| 20.4 | 40.20 | 63.2 | 20.6 | 54.72 | 49.9 | 20.1 | 57.32 | 48.7 | 20.2 | 59.23 | 24.5 |
| 21.4 | 39.62 | 63.6 | 21.6 | 55.17 | 50.2 | 21.1 | 57.02 | 48.4 | 21.2 | 57.88 | 24.4 |
| 22.4 | 38.98 | 63.9 | 22.6 | 55.58 | 50.5 | 22.1 | 56.73 | 48.1 | 22.2 | 56.60 | 24.2 |
| 23.4 | 38.33 | 64.2 | 23.6 | 55.98 | 50.7 | 23.1 | 56.48 | 47.8 | 23.2 | 55.39 | 24.0 |
| 24.4 | 37.68 | 64.5 | 24.6 | 56.34 | 50.9 | 24.1 | 56.26 | 47.5 | 24.2 | 54.24 | 23.8 |
| 25.4 | 37.05 | 64.8 | 25.6 | 56.68 | 51.1 | 25.1 | 56.02 | 47.2 | 25.2 | 53.15 | 23.6 |
| 26.4 | 36.47 | 65.1 | 26.6 | 57.02 | 51.3 | 26.1 | 55.81 | 46.9 | 26.2 | 52.09 | 23.4 |
| 27.1 | 35.93 | 65.3 | 27.6 | 57.35 | 51.6 | 27.1 | 55.59 | 46.6 | 27.1 | 51.07 | 23.2 |
| 28.4 | 35.40 | 65.6 | 28.6 | 57.71 | 51.8 | 28.1 | 55.38 | 46.3 | 28.1 | 50.03 | 23.0 |
| 29.4 | 34.90 | 65.9 | 29.6 | 58.09 | 52.0 | 29.1 | 55.14 | 46.1 | 29.1 | 48.98 | 22.9 |
| 30.4 | 34.39 | 66.2 | 30.6 | 58.49 | 52.2 | 30.1 | 54.89 | 45.8 | 30.1 | 47.83 | 22.7 |
| 31.3 | 33.84 | 66.5 | 31.6 | 58.90 | 52.4 | 31.1 | 54.64 | 45.5 | 31.1 | 46.65 | 22.5 |

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Ursæ Minoris. (Polaris.) | | Mean Solar Date. | 51 Cephei (Hev.) | | Mean Solar Date. | δ Ursæ Minoris. | | Mean Solar Date. | λ Ursæ Minoris. | |
|------------------------|--------------------------------------|----------------------------|------------------------|-----------------------------------|----------------------------|------------------------|-----------------------------------|----------------------------|------------------------|------------------------------------|----------------------------|
| | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. | | Right Ascen- sion. | Declina- tion North. |
| Dec. | ^h ^m 1 19 | +88° 44' | Dec. | ^h ^m 6 49 | +87° 12' | Dec. | ^h ^m 18 6 | +86° 36' | Dec. | ^h ^m 19 30 | +88° 58' |
| 1.3 | ^s 33.84 | 6.5 | 1.6 | ^s 58.90 | 52.4 | 1.1 | ^s 54.64 | 45.5 | 1.1 | ^s 46.65 | 22.5 |
| 2.3 | 33.23 | 6.8 | 2.6 | 59.32 | 52.6 | 2.1 | 54.37 | 45.2 | 2.1 | 45.45 | 22.4 |
| 3.3 | 32.57 | 7.1 | 3.6 | 59.74 | 52.9 | 3.1 | 54.12 | 44.9 | 3.1 | 44.24 | 22.2 |
| 4.3 | 31.83 | 7.4 | 4.6 | 60.13 | 53.2 | 4.1 | 53.88 | 44.6 | 4.1 | 43.02 | 21.9 |
| 5.3 | 31.04 | 7.7 | 5.6 | 60.50 | 53.5 | 5.0 | 53.65 | 44.2 | 5.1 | 41.86 | 21.7 |
| 6.3 | 30.22 | 8.0 | 6.6 | 60.85 | 53.8 | 6.0 | 53.44 | 43.9 | 6.1 | 40.75 | 21.4 |
| 7.3 | 29.38 | 8.3 | 7.6 | 61.16 | 54.1 | 7.0 | 53.28 | 43.5 | 7.1 | 39.72 | 21.1 |
| 8.3 | 28.57 | 8.5 | 8.6 | 61.43 | 54.4 | 8.0 | 53.11 | 43.2 | 8.1 | 38.76 | 20.9 |
| 9.3 | 27.79 | 8.7 | 9.6 | 61.70 | 54.7 | 9.0 | 52.97 | 42.8 | 9.1 | 37.87 | 20.6 |
| 10.3 | 27.05 | 8.9 | 10.6 | 61.97 | 54.9 | 10.0 | 52.83 | 42.5 | 10.1 | 37.02 | 20.4 |
| 11.3 | 26.35 | 9.2 | 11.5 | 62.22 | 55.2 | 11.0 | 52.69 | 42.2 | 11.1 | 36.17 | 20.1 |
| 12.3 | 25.67 | 9.4 | 12.5 | 62.51 | 55.4 | 12.0 | 52.54 | 41.9 | 12.1 | 35.31 | 19.9 |
| 13.3 | 25.00 | 9.6 | 13.5 | 62.79 | 55.7 | 13.0 | 52.40 | 41.6 | 13.1 | 34.43 | 19.7 |
| 14.3 | 24.33 | 9.9 | 14.5 | 63.11 | 55.9 | 14.0 | 52.23 | 41.3 | 14.1 | 33.50 | 19.5 |
| 15.3 | 23.61 | 10.1 | 15.5 | 63.44 | 56.2 | 15.0 | 52.06 | 41.0 | 15.1 | 32.55 | 19.2 |
| 16.3 | 22.81 | 10.3 | 16.5 | 63.73 | 56.5 | 16.0 | 51.89 | 40.7 | 16.1 | 31.56 | 19.0 |
| 17.3 | 21.96 | 10.6 | 17.5 | 64.03 | 56.8 | 17.0 | 51.75 | 40.3 | 17.1 | 30.60 | 18.7 |
| 18.3 | 21.05 | 10.8 | 18.5 | 64.32 | 57.1 | 18.0 | 51.61 | 40.0 | 18.1 | 29.66 | 18.4 |
| 19.3 | 20.08 | 11.0 | 19.5 | 64.55 | 57.5 | 19.0 | 51.51 | 39.6 | 19.1 | 28.79 | 18.1 |
| 20.3 | 19.10 | 11.2 | 20.5 | 64.76 | 57.8 | 20.0 | 51.41 | 39.2 | 20.1 | 28.01 | 17.8 |
| 21.3 | 18.12 | 11.4 | 21.5 | 64.94 | 58.1 | 21.0 | 51.36 | 38.8 | 21.1 | 27.29 | 17.5 |
| 22.3 | 17.15 | 11.5 | 22.5 | 65.09 | 58.5 | 22.0 | 51.31 | 38.5 | 22.1 | 26.67 | 17.2 |
| 23.3 | 16.23 | 11.7 | 23.5 | 65.23 | 58.8 | 22.9 | 51.26 | 38.1 | 23.1 | 26.10 | 16.9 |
| 24.3 | 15.37 | 11.8 | 24.5 | 65.37 | 59.1 | 23.9 | 51.24 | 37.8 | 24.1 | 25.54 | 16.6 |
| 25.3 | 14.54 | 11.9 | 25.5 | 65.52 | 59.3 | 24.9 | 51.19 | 37.5 | 25.1 | 25.00 | 16.3 |
| 26.3 | 13.74 | 12.1 | 26.5 | 65.69 | 59.6 | 25.9 | 51.15 | 37.2 | 26.1 | 24.45 | 16.0 |
| 27.3 | 12.94 | 12.2 | 27.5 | 65.87 | 59.9 | 26.9 | 51.09 | 36.8 | 27.1 | 23.85 | 15.8 |
| 28.3 | 12.11 | 12.4 | 28.5 | 66.05 | 60.2 | 27.9 | 51.03 | 36.5 | 28.1 | 23.23 | 15.5 |
| 29.3 | 11.26 | 12.6 | 29.5 | 66.26 | 60.5 | 28.9 | 50.97 | 36.2 | 29.1 | 22.55 | 15.2 |
| 30.3 | 10.36 | 12.7 | 30.5 | 66.46 | 60.8 | 29.9 | 50.88 | 35.8 | 30.1 | 21.88 | 14.9 |
| 31.3 | 9.38 | 12.9 | 31.5 | 66.66 | 61.2 | 30.9 | 50.84 | 35.5 | 31.1 | 21.21 | 14.6 |
| 32.3 | 8.35 | 13.1 | 32.5 | 66.81 | 61.5 | 31.9 | 50.80 | 35.1 | 32.1 | 20.57 | 14.3 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Andromedæ. | | γ Pegasi. (Algenib.) | | β Hydri. | | 12 Ceti. | |
|------------------------|-------------------------------------|-----------------------|-------------------------------------|-----------------------|--------------------------------------|-----------------------|--------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination South. |
| | ^h 0 ^m 2 | +28° 29' | ^h 0 ^m 7 | +14° 34' | ^h 0 ^m 19 | -77° 51' | ^h 0 ^m 24 | - 4° 33' |
| (Dec.30.2) | ^s 43.93 -.14 | 21.1 -0.8 | ^s 36.18 -.11 | 36.6 -0.7 | ^s 60.24 -.30 | 91.9 +0.7 | ^s 27.52 -.11 | 43.6 -0.6 |
| Jan. 9.2 | 43.79 .13 | 20.2 1.1 | 36.07 .11 | 35.8 0.9 | 59.37 .85 | 90.8 1.3 | 27.42 .11 | 44.2 0.5 |
| 19.2 | 43.66 .13 | 19.0 1.3 | 35.96 .10 | 34.8 1.0 | 58.55 .78 | 89.2 1.9 | 27.31 .10 | 44.7 0.4 |
| 29.2 | 43.54 .11 | 17.6 1.5 | 35.86 .09 | 33.8 1.0 | 57.81 .69 | 87.0 2.4 | 27.22 .09 | 45.0 0.3 |
| Feb. 8.1 | 43.44 .09 | 16.1 1.6 | 35.78 .07 | 32.8 1.0 | 57.18 .58 | 84.3 2.9 | 27.13 .08 | 45.3 -0.2 |
| 18.1 | 43.36 -.06 | 14.5 -1.6 | 35.72 -.05 | 31.8 -0.9 | 56.66 -.45 | 81.2 +3.2 | 27.07 -.06 | 45.4 0.0 |
| 28.1 | 43.32 -.03 | 12.9 1.6 | 35.68 -.02 | 30.9 0.8 | 56.28 .31 | 77.9 3.5 | 27.02 -.03 | 45.2 +0.2 |
| Mar.10.0 | 43.31 +.01 | 11.4 1.5 | 35.68 +.01 | 30.1 0.7 | 56.04 .16 | 74.2 3.7 | 27.01 .00 | 44.9 0.4 |
| 20.0 | 43.34 .05 | 10.0 1.3 | 35.71 .05 | 29.5 0.5 | 55.96 -.01 | 70.4 3.8 | 27.02 +.04 | 44.3 0.7 |
| 30.0 | 43.42 .10 | 8.8 1.0 | 35.78 .09 | 29.2 -0.2 | 56.03 +.15 | 66.5 3.8 | 27.08 .07 | 43.5 0.9 |
| Apr. 9.0 | 43.54 +.15 | 7.9 -0.7 | 35.89 +.13 | 29.1 +0.1 | 56.26 +.31 | 62.7 +3.8 | 27.17 +.11 | 42.5 +1.2 |
| 18.9 | 43.71 .19 | 7.4 -0.4 | 36.05 .17 | 29.3 0.4 | 56.65 .46 | 58.9 3.7 | 27.30 .15 | 41.2 1.4 |
| 28.9 | 43.93 .23 | 7.2 0.0 | 36.24 .22 | 29.8 0.7 | 57.19 .60 | 55.3 3.5 | 27.48 .19 | 39.7 1.6 |
| May 8.9 | 44.18 .27 | 7.4 +0.4 | 36.48 .25 | 30.6 1.0 | 57.86 .74 | 51.9 3.2 | 27.69 .23 | 38.0 1.8 |
| 18.8 | 44.47 .30 | 8.0 0.8 | 36.74 .28 | 31.8 1.3 | 58.67 .86 | 48.9 2.8 | 27.94 .26 | 36.2 1.9 |
| 28.8 | 44.78 +.33 | 8.9 +1.1 | 37.04 +.30 | 33.2 +1.5 | 59.60 +.97 | 46.2 +2.4 | 28.22 +.29 | 34.1 +2.0 |
| June 7.8 | 45.12 .34 | 10.2 1.4 | 37.35 .32 | 34.8 1.8 | 60.61 1.06 | 44.0 2.0 | 28.51 .31 | 32.0 2.1 |
| 17.8 | 45.46 .35 | 11.9 1.7 | 37.67 .33 | 36.7 2.0 | 61.69 1.10 | 42.3 1.5 | 28.83 .32 | 29.9 2.1 |
| 27.7 | 45.81 .34 | 13.9 2.1 | 37.99 .32 | 38.8 2.1 | 62.81 1.13 | 41.1 0.9 | 29.15 .32 | 27.8 2.1 |
| July 7.7 | 46.15 .33 | 16.0 2.3 | 38.31 .31 | 40.9 2.2 | 63.94 1.13 | 40.4 +0.4 | 29.46 .31 | 25.8 2.0 |
| 17.7 | 46.47 +.31 | 18.4 +2.4 | 38.62 +.29 | 43.1 +2.2 | 65.06+1.10 | 40.4 -0.2 | 29.77 +.30 | 23.9 +1.8 |
| 27.7 | 46.77 .23 | 20.8 2.5 | 38.91 .27 | 45.3 2.2 | 66.13 1.03 | 40.9 0.8 | 30.07 .26 | 22.2 1.6 |
| Aug. 6.6 | 47.04 .25 | 23.4 2.5 | 39.16 .24 | 47.4 2.1 | 67.13 .94 | 42.0 1.3 | 30.33 .25 | 20.6 1.4 |
| 16.6 | 47.27 .21 | 25.9 2.5 | 39.39 .21 | 49.5 2.0 | 68.01 .81 | 43.5 1.8 | 30.57 .22 | 19.4 1.2 |
| 26.6 | 47.46 .17 | 28.4 2.4 | 39.58 .17 | 51.4 1.8 | 68.76 .67 | 45.6 2.2 | 30.78 .19 | 18.4 0.9 |
| Sept. 5.5 | 47.61 +.13 | 30.8 +2.3 | 39.73 +.13 | 53.1 +1.6 | 69.35 +.50 | 48.0 -2.6 | 30.95 +.15 | 17.6 +0.6 |
| 15.5 | 47.72 .09 | 33.1 2.2 | 39.85 .10 | 54.7 1.4 | 69.76 .32 | 50.8 2.8 | 31.08 .11 | 17.2 0.3 |
| 25.5 | 47.80 .05 | 35.2 2.0 | 39.93 .06 | 56.0 1.2 | 69.99 +.13 | 53.7 3.0 | 31.17 .08 | 17.0 +0.1 |
| Oct. 5.5 | 47.83 +.02 | 37.1 1.8 | 39.97 +.02 | 57.1 1.0 | 70.03 -.04 | 56.7 3.0 | 31.23 .05 | 17.0 -0.1 |
| 15.4 | 47.83 -.02 | 38.8 1.6 | 39.98 -.01 | 58.0 0.8 | 69.88 .24 | 59.7 2.9 | 31.26 +.01 | 17.3 0.3 |
| 25.4 | 47.80 -.05 | 40.2 +1.3 | 39.96 -.03 | 58.7 +0.5 | 69.54 -.41 | 62.6 -2.7 | 31.26 -.02 | 17.7 -0.5 |
| Nov. 4.4 | 47.74 .07 | 41.4 1.0 | 39.91 .06 | 59.1 0.3 | 69.05 .57 | 65.1 2.4 | 31.23 .02 | 18.3 0.6 |
| 14.4 | 47.66 .09 | 42.2 0.7 | 39.85 .08 | 59.3 +0.1 | 68.41 .70 | 67.3 2.0 | 31.18 .06 | 19.0 0.7 |
| 24.3 | 47.55 .11 | 42.7 0.4 | 39.76 .09 | 59.3 -0.1 | 67.66 .80 | 69.0 1.5 | 31.11 .08 | 19.7 0.7 |
| Dec. 4.3 | 47.44 .12 | 43.0 +0.1 | 39.67 .10 | 59.1 0.3 | 66.82 .86 | 70.2 0.9 | 31.02 .09 | 20.5 0.7 |
| 14.3 | 47.31 -.13 | 42.9 -0.2 | 39.56 -.11 | 58.8 -0.5 | 65.93 -.92 | 70.7 -0.2 | 30.93 -.10 | 21.2 -0.7 |
| 24.2 | 47.17 .14 | 42.5 0.5 | 39.45 .11 | 58.2 0.6 | 65.02 .91 | 70.7 +0.4 | 30.83 .10 | 21.9 0.7 |
| 34.2 | 47.04 -.14 | 41.8 -0.8 | 39.34 -.11 | 57.5 -0.7 | 64.11 -.90 | 70.0 +1.0 | 30.72 -.11 | 22.5 -0.6 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Cassiopeæ. | | β Ceti. | | 21 Cassiopeæ. | | ϵ Piscium. | |
|------------------------|-----------------------------------|-----------------------|-----------------------------------|-----------------------|-----------------------------------|-----------------------|-----------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h ^m 0 34 | +55° 56' | ^h ^m 0 38 | -18° 34' | ^h ^m 0 38 | +74° 23' | ^h ^m 0 57 | + 7° 18' |
| (Dec.30.3) | ^s 18.13 - .29 | 32.0 - 0.1 | ^s 6.22 - .12 | 80.0 - 0.6 | ^s 25.42 - .71 | 45.2 + 0.3 | ^s 16.27 - .11 | 7.0 - 0.6 |
| Jan. 9.2 | 17.85 .29 | 31.6 0.6 | 6.10 .12 | 80.5 0.3 | 24.70 .72 | 45.2 - 0.3 | 16.16 .11 | 6.3 0.6 |
| 19.2 | 17.56 .28 | 30.7 1.2 | 5.98 .11 | 80.7 - 0.1 | 23.98 .70 | 44.6 0.9 | 16.04 .12 | 5.6 0.7 |
| 29.2 | 17.28 .26 | 29.4 1.6 | 5.87 .10 | 80.6 + 0.2 | 23.29 .68 | 43.5 1.4 | 15.93 .11 | 5.0 0.6 |
| Feb. 8.1 | 17.03 .23 | 27.6 1.9 | 5.77 .09 | 80.3 0.5 | 22.66 .59 | 41.8 1.9 | 15.82 .10 | 4.4 0.6 |
| 18.1 | 16.82 - .19 | 25.6 - 2.2 | 5.69 - .07 | 79.7 + 0.7 | 22.11 - .49 | 39.6 - 2.3 | 15.73 - .06 | 3.8 - 0.5 |
| 28.1 | 16.66 .13 | 23.2 2.4 | 5.63 .04 | 78.8 1.0 | 21.67 .37 | 37.1 2.6 | 15.65 .06 | 3.4 0.4 |
| Mar. 10.1 | 16.55 - .07 | 20.8 2.5 | 5.60 - .01 | 77.7 1.3 | 21.36 .24 | 34.3 2.8 | 15.60 - .03 | 3.1 - 0.2 |
| 20.1 | 16.51 .00 | 18.3 2.5 | 5.60 + 0.2 | 76.3 1.5 | 21.20 - .09 | 31.4 2.9 | 15.59 .00 | 2.9 0.0 |
| 30.0 | 16.54 + 0.7 | 15.8 2.3 | 5.64 .06 | 74.7 1.7 | 21.18 + 0.6 | 28.5 2.9 | 15.61 + 0.4 | 3.0 + 0.2 |
| Apr. 9.0 | 16.65 + 1.4 | 13.6 - 2.1 | 5.72 + 1.0 | 72.8 + 2.0 | 21.32 + 2.2 | 25.6 - 2.7 | 15.67 + 0.8 | 3.3 + 0.4 |
| 19.0 | 16.83 .21 | 11.6 1.8 | 5.84 .14 | 70.8 2.2 | 21.62 .37 | 23.0 2.5 | 15.78 .13 | 3.9 0.7 |
| 29.0 | 17.08 .28 | 9.9 1.4 | 6.01 .18 | 68.6 2.3 | 22.06 .50 | 20.7 2.1 | 15.92 .17 | 4.7 0.9 |
| May 8.9 | 17.40 .26 | 8.7 1.0 | 6.21 .22 | 66.2 2.4 | 22.62 .62 | 18.8 1.7 | 16.11 .21 | 5.8 1.2 |
| 18.9 | 17.78 .40 | 7.9 - 0.5 | 6.45 .26 | 63.8 2.4 | 23.29 .72 | 17.3 1.2 | 16.34 .24 | 7.1 1.4 |
| 28.9 | 18.20 + 4.4 | 7.6 0.0 | 6.73 + 2.2 | 61.4 + 2.4 | 24.06 + 7.2 | 16.4 - 0.7 | 16.60 + 2.7 | 8.7 + 1.6 |
| June 7.8 | 18.65 .46 | 7.8 + 0.5 | 7.03 .31 | 59.0 2.3 | 24.88 .84 | 16.0 - 0.1 | 16.88 .29 | 10.4 1.8 |
| 17.8 | 19.12 .48 | 8.6 1.0 | 7.34 .32 | 56.7 2.2 | 25.75 .87 | 16.1 + 0.4 | 17.19 .31 | 12.3 1.9 |
| 27.8 | 19.60 .48 | 9.7 1.4 | 7.67 .33 | 54.6 2.0 | 26.64 .88 | 16.8 1.0 | 17.51 .32 | 14.3 2.0 |
| July 7.8 | 20.08 .47 | 11.4 1.8 | 8.00 .33 | 52.6 1.8 | 27.51 .86 | 18.0 1.5 | 17.83 .32 | 16.3 2.0 |
| 17.7 | 20.54 + 4.5 | 13.4 + 2.2 | 8.33 + 3.2 | 50.9 + 1.5 | 28.36 + 8.2 | 19.8 + 1.9 | 18.14 + 3.1 | 18.4 + 2.0 |
| 27.7 | 20.98 .42 | 15.8 2.5 | 8.64 .30 | 49.5 1.2 | 29.16 .77 | 21.9 2.4 | 18.45 .29 | 20.3 1.9 |
| Aug. 6.7 | 21.38 .38 | 18.5 2.8 | 8.93 .27 | 48.5 0.9 | 29.89 .69 | 24.5 2.8 | 18.73 .27 | 22.2 1.8 |
| 16.6 | 21.73 .33 | 21.4 3.0 | 9.18 .24 | 47.8 0.5 | 30.54 .61 | 27.5 3.1 | 18.99 .24 | 23.9 1.6 |
| 26.6 | 22.03 .28 | 24.6 3.2 | 9.41 .21 | 47.4 + 0.2 | 31.10 .51 | 30.7 3.3 | 19.22 .21 | 25.5 1.4 |
| Sept. 5.6 | 22.28 + 2.2 | 27.8 + 3.3 | 9.60 + 1.7 | 47.4 - 0.2 | 31.56 + 4.0 | 34.2 + 3.5 | 19.41 + 1.8 | 26.8 + 1.2 |
| 15.6 | 22.48 .16 | 31.1 3.2 | 9.75 .13 | 47.7 0.5 | 31.90 .28 | 37.8 3.7 | 19.58 .15 | 27.9 1.0 |
| 25.5 | 22.61 .11 | 34.4 3.2 | 9.86 .09 | 48.4 0.8 | 32.14 .17 | 41.5 3.7 | 19.70 .11 | 28.8 0.8 |
| Oct. 5.5 | 22.69 + 0.6 | 37.6 3.1 | 9.94 .05 | 49.2 1.0 | 32.25 + 0.5 | 45.2 3.7 | 19.80 .08 | 29.5 0.5 |
| 15.5 | 22.71 .00 | 40.6 2.9 | 9.97 + 0.2 | 50.3 1.1 | 32.24 - 0.6 | 48.9 3.6 | 19.86 .05 | 29.9 0.3 |
| 25.5 | 22.68 - 0.5 | 43.5 + 2.7 | 9.98 - 0.1 | 51.5 - 1.2 | 32.12 - 1.8 | 52.4 + 3.4 | 19.89 + 0.2 | 30.2 + 0.1 |
| Nov. 4.4 | 22.60 .10 | 46.1 2.4 | 9.95 .04 | 52.8 1.3 | 31.88 .29 | 55.7 3.1 | 19.89 - 0.1 | 30.2 0.0 |
| 14.4 | 22.48 .15 | 48.4 2.0 | 9.90 .06 | 54.1 1.3 | 31.54 .39 | 58.7 2.8 | 19.87 .03 | 30.1 - 0.2 |
| 24.4 | 22.31 .19 | 50.2 1.6 | 9.83 .08 | 55.4 1.2 | 31.10 .49 | 61.3 2.4 | 19.83 .05 | 29.9 0.3 |
| Dec. 4.3 | 22.10 .22 | 51.8 1.2 | 9.74 .10 | 56.5 1.1 | 30.56 .57 | 63.4 1.9 | 19.76 .07 | 29.5 0.4 |
| 14.3 | 21.86 - .25 | 52.7 + 0.7 | 9.64 - .11 | 57.5 - 0.9 | 29.95 - .64 | 65.0 + 1.3 | 19.68 - .09 | 29.0 - 0.5 |
| 24.3 | 21.60 .27 | 53.2 + 0.2 | 9.52 .11 | 58.3 0.7 | 29.28 .70 | 66.1 0.7 | 19.59 .10 | 28.5 0.6 |
| 34.3 | 21.32 - .28 | 53.2 - 0.3 | 9.41 - .12 | 58.9 - 0.5 | 28.58 - .72 | 68.5 + 0.1 | 19.48 - .11 | 27.9 - 0.6 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | β Andromedæ. | | θ^1 Ceti. | | 38 Cassiopeæ. | | η Piscium. | |
|------------------------|-------------------------------------|---------------------------------------|--------------------------------------|--|--------------------------------------|--|--------------------------------------|--|
| | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 1 ^m 3 | [°] +35 ['] 2 | ^h 1 ^m 18 | [°] - 8 ['] 44 | ^h 1 ^m 23 | [°] +69 ['] 41 | ^h 1 ^m 25 | [°] +14 ['] 46 |
| (Dec.30.3) | ^s 36.82 -15 | 37.8 -0.9 | ^s 33.81 -11 | 55.1 -0.7 | ^s 6.37 -49 | 85.0 +0.8 | ^s 38.28 -11 | 60.1 -0.5 |
| Jan. 9.3 | 36.66 .16 | 37.5 0.5 | 33.70 .12 | 55.8 0.6 | 5.86 .52 | 85.5 +0.2 | 38.16 .12 | 59.6 0.6 |
| 19.2 | 36.50 .17 | 36.8 0.8 | 33.58 .12 | 56.3 0.4 | 5.33 .53 | 85.5 -0.3 | 38.04 .13 | 59.0 0.7 |
| 29.2 | 36.33 .16 | 35.8 1.1 | 33.46 .12 | 56.6 -0.2 | 4.80 .52 | 84.9 0.9 | 37.91 .13 | 58.3 0.7 |
| Feb. 8.2 | 36.18 .15 | 34.5 1.3 | 33.34 .11 | 56.8 0.0 | 4.28 .49 | 83.7 1.4 | 37.78 .12 | 57.6 0.7 |
| 18.1 | 36.04 -13 | 33.1 -1.5 | 33.23 -10 | 56.7 +0.2 | 3.81 -44 | 82.0 -1.9 | 37.67 -11 | 56.8 -0.7 |
| 28.1 | 35.92 .10 | 31.6 1.6 | 33.14 .08 | 56.4 0.4 | 3.40 .36 | 80.0 2.2 | 37.57 .09 | 56.1 0.7 |
| Mar. 10.1 | 35.84 .06 | 29.9 1.6 | 33.08 .05 | 55.8 0.7 | 3.08 .27 | 77.6 2.5 | 37.49 .06 | 55.5 0.6 |
| 20.1 | 35.80 -0.02 | 28.4 1.5 | 33.04 -0.02 | 55.0 0.9 | 2.86 .17 | 75.0 2.7 | 37.45 -0.03 | 55.0 0.4 |
| 30.0 | 35.81 +0.03 | 26.9 1.4 | 33.04 +0.02 | 54.0 1.1 | 2.75 -0.05 | 72.2 2.7 | 37.44 +0.1 | 54.6 -0.2 |
| Apr. 9.0 | 35.87 +0.08 | 25.6 -1.2 | 33.07 +0.06 | 52.8 +1.4 | 2.76 +0.07 | 69.5 -2.7 | 37.47 +0.06 | 54.4 0.6 |
| 19.0 | 35.98 .14 | 24.5 0.9 | 33.15 .10 | 51.3 1.6 | 2.89 .19 | 66.9 2.5 | 37.55 .11 | 54.5 +0.5 |
| 29.0 | 36.15 .19 | 23.7 0.6 | 33.28 .14 | 49.6 1.8 | 3.14 .31 | 64.5 2.2 | 37.68 .15 | 54.9 0.5 |
| May 8.9 | 36.36 .24 | 23.3 -0.2 | 33.44 .18 | 47.7 2.0 | 3.51 .42 | 62.4 1.9 | 37.85 .19 | 55.5 0.7 |
| 18.9 | 36.62 .28 | 23.2 +0.1 | 33.65 .22 | 45.7 2.1 | 3.97 .51 | 60.7 1.5 | 38.06 .23 | 56.4 1.0 |
| 28.9 | 36.92 +31 | 23.5 +0.5 | 33.89 +25 | 43.5 +2.2 | 4.53 +5.9 | 59.4 -1.0 | 38.31 +2.6 | 57.5 +1.5 |
| June 7.8 | 37.25 .34 | 24.2 0.9 | 34.16 .28 | 41.3 2.2 | 5.15 .65 | 58.6 -0.5 | 38.58 .29 | 58.9 1.2 |
| 17.8 | 37.60 .36 | 25.3 1.2 | 34.45 .30 | 39.0 2.2 | 5.83 .69 | 58.3 0.0 | 38.89 .31 | 60.4 1.7 |
| 27.8 | 37.96 .37 | 26.7 1.5 | 34.76 .31 | 36.9 2.1 | 6.54 .72 | 58.6 +0.5 | 39.20 .32 | 62.2 1.8 |
| July 7.8 | 38.33 .36 | 28.4 1.8 | 35.08 .32 | 34.8 2.0 | 7.26 .72 | 59.3 1.0 | 39.53 .32 | 64.1 1.9 |
| 17.7 | 38.69 +35 | 30.4 +2.0 | 35.40 +31 | 32.8 +1.8 | 7.99 +7.1 | 60.6 +1.5 | 39.85 +3.2 | 66.0 +2.0 |
| 27.7 | 39.04 .33 | 32.5 2.2 | 35.71 .30 | 31.1 1.6 | 8.69 .69 | 62.3 1.9 | 40.17 .31 | 68.0 2.0 |
| Aug. 6.7 | 39.36 .31 | 34.8 2.4 | 36.00 .28 | 29.6 1.3 | 9.36 .64 | 64.4 2.3 | 40.47 .29 | 69.9 1.9 |
| 16.6 | 39.66 .28 | 37.3 2.5 | 36.27 .26 | 28.4 1.0 | 9.98 .59 | 66.9 2.6 | 40.75 .27 | 71.8 1.8 |
| 26.6 | 39.92 .25 | 39.7 2.6 | 36.52 .23 | 27.5 0.7 | 10.54 .53 | 69.7 2.9 | 41.00 .24 | 73.6 1.7 |
| Sept. 5.6 | 40.15 +21 | 42.2 +2.5 | 36.73 +20 | 27.0 +0.4 | 11.03 +4.5 | 72.8 +3.2 | 41.23 +2.1 | 75.2 +1.5 |
| 15.6 | 40.34 .17 | 44.7 2.4 | 36.92 .16 | 26.7 +0.1 | 11.44 .37 | 76.1 3.4 | 41.42 .18 | 76.7 1.3 |
| 25.5 | 40.49 .13 | 47.0 2.3 | 37.06 .13 | 26.7 -0.2 | 11.78 .29 | 79.5 3.5 | 41.58 .14 | 78.0 1.2 |
| Oct. 5.5 | 40.60 .09 | 49.2 2.2 | 37.18 .10 | 27.0 0.4 | 12.02 .20 | 83.0 3.5 | 41.70 .11 | 79.0 1.0 |
| 15.5 | 40.68 .06 | 51.3 2.0 | 37.26 .06 | 27.6 0.6 | 12.18 .11 | 86.5 3.5 | 41.79 .08 | 79.9 0.8 |
| 25.5 | 40.72 +0.02 | 53.2 +1.8 | 37.30 +0.03 | 28.3 -0.8 | 12.24 +0.02 | 90.0 +3.4 | 41.85 +0.05 | 80.6 +0.6 |
| Nov. 4.4 | 40.72 -0.01 | 54.8 1.5 | 37.32 .00 | 29.2 0.9 | 12.22 -0.07 | 93.3 3.2 | 41.89 +0.02 | 81.1 0.4 |
| 14.4 | 40.69 .04 | 56.2 1.3 | 37.31 -0.02 | 30.2 1.0 | 12.10 .16 | 96.4 2.9 | 41.89 -0.01 | 81.4 0.2 |
| 24.4 | 40.63 .07 | 57.4 1.0 | 37.28 .04 | 31.2 1.0 | 11.90 .24 | 99.2 2.6 | 41.87 .03 | 81.5 +0.1 |
| Dec. 4.3 | 40.55 .10 | 58.2 0.7 | 37.22 .06 | 32.2 1.0 | 11.61 .32 | 101.6 2.2 | 41.82 .06 | 81.5 -0.1 |
| 14.3 | 40.44 -1.2 | 58.7 +0.3 | 37.15 -0.08 | 33.2 -0.9 | 11.25 -0.39 | 103.5 +1.7 | 41.76 -0.06 | 81.3 -0.2 |
| 24.3 | 40.30 .14 | 58.9 0.0 | 37.06 .10 | 34.1 0.8 | 10.82 .45 | 105.0 1.2 | 41.67 .10 | 81.0 0.4 |
| 34.3 | 40.16 -1.5 | 58.7 -0.3 | 36.95 -1.1 | 34.8 -0.7 | 10.34 -0.50 | 105.9 +0.6 | 41.57 -1.1 | 80.6 -0.5 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Eridani. (Achernar.) | | ϵ Piscium. | | β Arietis. | | 50 Cassiopeæ. | |
|------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------------|
| | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h ^m 1 33 | [°] 47' | ^h ^m 1 39 | [°] 8 36' | ^h ^m 1 48 | [°] 20 16' | ^h ^m 1 54 | [°] 71 53' |
| (Dec.30.3) | ^s 39.08 -31 | ["] 48.8 -0.7 | ^s 37.61 -10 | ["] 28.2 -0.5 | ^s 36.45 -11 | ["] 30.6 -0.3 | ^s 7.35 -52 | ["] 49.8 +1.2 |
| Jan. 9.3 | 38.76 .32 | 49.2 -0.1 | 37.50 .11 | 27.7 0.6 | 36.34 .12 | 30.2 0.4 | 6.80 .57 | 50.8 0.7 |
| 19.2 | 38.44 .32 | 49.1 +0.5 | 37.38 .12 | 27.1 0.6 | 36.21 .13 | 29.7 0.6 | 6.21 .60 | 51.2 +0.1 |
| 29.2 | 38.12 .31 | 48.3 1.0 | 37.26 .13 | 26.5 0.6 | 36.07 .14 | 29.1 0.7 | 5.60 .61 | 51.0 -0.5 |
| Feb. 8.2 | 37.82 .29 | 47.0 1.5 | 37.13 .12 | 26.0 0.5 | 35.92 .14 | 28.4 0.8 | 4.99 .59 | 50.3 1.0 |
| 18.1 | 37.54 -.26 | 45.3 +2.0 | 37.01 -.11 | 25.4 -0.5 | 35.79 -.13 | 27.6 -0.8 | 4.42 -.55 | 49.0 -1.5 |
| 28.1 | 37.29 .22 | 43.0 2.4 | 36.91 .09 | 25.0 0.4 | 35.67 .11 | 26.8 0.8 | 3.90 .48 | 47.3 1.9 |
| Mar.10.1 | 37.09 .18 | 40.4 2.8 | 36.82 .07 | 24.7 0.2 | 35.57 .08 | 25.9 0.6 | 3.46 .39 | 45.2 2.3 |
| 20.1 | 36.94 .12 | 37.4 3.1 | 36.77 -.04 | 24.5 -0.1 | 35.50 .05 | 25.2 0.7 | 3.13 .28 | 42.7 2.5 |
| 30.0 | 36.84 -.06 | 34.1 3.4 | 36.75 .00 | 24.5 +0.1 | 35.47 -.01 | 24.6 0.6 | 2.91 .15 | 40.1 2.7 |
| Apr. 9.0 | 36.81 .00 | 30.6 +3.5 | 36.77 +0.4 | 24.7 +0.3 | 35.48 +0.3 | 24.1 -0.4 | 2.82 -.02 | 37.4 -2.7 |
| 19.0 | 36.85 +0.7 | 27.1 3.6 | 36.83 .08 | 25.2 0.6 | 35.54 .08 | 23.8 -0.1 | 2.87 +.12 | 34.7 2.6 |
| 29.0 | 36.96 .14 | 23.4 3.7 | 36.94 .13 | 25.9 0.8 | 35.64 .13 | 23.8 +0.1 | 3.06 .25 | 32.1 2.4 |
| May 8.9 | 37.14 .21 | 19.8 3.6 | 37.09 .17 | 26.8 1.0 | 35.80 .18 | 24.0 0.4 | 3.38 .38 | 29.8 2.2 |
| 18.9 | 37.39 .28 | 16.2 3.4 | 37.28 .21 | 28.0 1.3 | 35.99 .22 | 24.5 0.6 | 3.82 .49 | 27.8 1.8 |
| 28.9 | 37.70 +3.4 | 12.9 +3.2 | 37.52 +.25 | 29.4 +1.5 | 36.23 +.25 | 25.3 +0.9 | 4.36 +.59 | 26.2 -1.4 |
| June 7.8 | 38.07 .39 | 9.7 3.0 | 37.78 .28 | 30.9 1.7 | 36.50 .28 | 26.3 1.2 | 5.00 .68 | 25.0 1.0 |
| 17.8 | 38.48 .43 | 7.0 2.6 | 38.07 .30 | 32.7 1.8 | 36.80 .31 | 27.6 1.4 | 5.72 .74 | 24.2 -0.5 |
| 27.8 | 38.94 .46 | 4.6 2.2 | 38.38 .31 | 34.5 1.9 | 37.12 .33 | 29.1 1.6 | 6.48 .78 | 24.0 0.0 |
| July 7.8 | 39.41 .48 | 2.6 1.7 | 38.70 .32 | 36.4 1.9 | 37.45 .33 | 30.8 1.7 | 7.28 .80 | 24.3 +0.5 |
| 17.7 | 39.90 +.49 | 1.2 +1.2 | 39.02 +.32 | 38.4 +1.9 | 37.78 +.33 | 32.6 +1.8 | 8.09 +.81 | 25.1 +1.0 |
| 27.7 | 40.39 .48 | 0.3 0.6 | 39.33 .31 | 40.3 1.9 | 38.11 .32 | 34.4 1.9 | 8.89 .79 | 26.3 1.5 |
| Aug. 6.7 | 40.87 .46 | 0.0 +0.1 | 39.63 .29 | 42.1 1.8 | 38.43 .30 | 36.3 1.9 | 9.67 .76 | 28.0 1.9 |
| 16.6 | 41.31 .43 | 0.2 -0.5 | 39.92 .27 | 43.8 1.6 | 38.72 .28 | 38.2 1.9 | 10.41 .71 | 30.1 2.3 |
| 26.6 | 41.72 .39 | 1.0 1.1 | 40.17 .24 | 45.4 1.4 | 39.00 .26 | 40.1 1.8 | 11.10 .65 | 32.6 2.6 |
| Sept. 5.6 | 42.08 +.33 | 2.4 -1.6 | 40.40 +.21 | 46.7 +1.2 | 39.24 +.23 | 41.9 +1.7 | 11.72 +.58 | 35.4 +2.9 |
| 15.6 | 42.39 .27 | 4.2 2.0 | 40.60 .18 | 47.8 1.0 | 39.46 .20 | 43.5 1.6 | 12.27 .51 | 38.5 3.2 |
| 25.5 | 42.63 .20 | 6.4 2.4 | 40.78 .15 | 48.8 0.8 | 39.65 .17 | 45.0 1.4 | 12.73 .42 | 41.7 3.3 |
| Oct. 5.5 | 42.80 .13 | 9.0 2.7 | 40.91 .12 | 49.5 0.6 | 39.80 .14 | 46.3 1.2 | 13.11 .33 | 45.2 3.4 |
| 15.5 | 42.90 +.06 | 11.8 2.8 | 41.02 .09 | 49.9 0.4 | 39.92 .11 | 47.5 1.0 | 13.38 .23 | 48.6 3.5 |
| 25.5 | 42.93 .00 | 14.6 -2.2 | 41.09 +.06 | 50.2 +0.2 | 40.01 +.07 | 48.5 +0.8 | 13.56 +.12 | 52.1 +3.5 |
| Nov. 4.4 | 42.89 -.06 | 17.5 2.8 | 41.14 +.03 | 50.3 0.0 | 40.07 .04 | 49.3 0.7 | 13.63 +.02 | 55.5 3.3 |
| 14.4 | 42.79 .13 | 20.2 2.6 | 41.15 .00 | 50.3 -0.1 | 40.09 +.01 | 49.9 0.5 | 13.60 -.09 | 58.8 3.1 |
| 24.4 | 42.63 .18 | 22.7 2.3 | 41.14 -.02 | 50.1 0.2 | 40.09 -.02 | 50.3 0.3 | 13.46 .19 | 61.8 2.9 |
| Dec. 4.3 | 42.42 .23 | 24.9 1.9 | 41.11 .05 | 49.8 0.3 | 40.06 .04 | 50.6 +0.2 | 13.21 .29 | 64.5 2.5 |
| 14.3 | 42.17 -.27 | 26.7 -1.5 | 41.05 -.07 | 49.4 -0.4 | 40.01 -.07 | 50.7 0.0 | 12.88 -.38 | 66.9 +2.1 |
| 24.3 | 41.88 .29 | 27.9 1.0 | 40.98 .09 | 48.9 0.5 | 39.93 .09 | 50.6 -0.1 | 12.45 .46 | 68.8 1.6 |
| 34.3 | 41.58 -.31 | 28.6 -0.5 | 40.88 -.11 | 48.4 -0.6 | 39.83 -.11 | 50.4 -0.3 | 11.94 -.53 | 70.1 +1.0 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | γ Ceti. | | α Ceti. | | 48 Cephei (H.) | | ζ Arietis. | |
|------------------------|--------------------------------------|-----------------------|--------------------------------------|-----------------------|-------------------------------------|-----------------------|-------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 2 ^m 37 | + 2° 46' | ^h 2 ^m 56 | + 3° 39' | ^h 3 ^m 6 | + 77° 19' | ^h 3 ^m 8 | + 20° 38' |
| (Dec. 30.3 | ^s 38.82 - .08 | 29.9 - 0.7 | ^s 34.65 - .07 | 38.8 - 0.7 | ^s 31.12 - .59 | 72.3 + 2.2 | ^s 37.92 - .07 | 25.8 0.0 |
| Jan. 9.3 | 38.73 .10 | 29.9 0.6 | 34.57 .10 | 38.2 0.6 | 30.48 .00 | 74.3 1.7 | 37.84 .10 | 25.7 - 0.1 |
| 19.2 | 38.62 .12 | 28.6 0.6 | 34.46 .12 | 37.6 0.5 | 29.73 .80 | 75.8 1.2 | 37.73 .12 | 25.6 0.2 |
| 29.2 | 38.49 .13 | 28.1 0.5 | 34.34 .13 | 37.1 0.5 | 28.89 .87 | 76.7 + 0.6 | 37.60 .14 | 25.3 0.3 |
| Feb. 8.2 | 38.35 .14 | 27.7 0.4 | 34.19 .14 | 36.7 0.4 | 28.00 .90 | 77.0 0.0 | 37.44 .16 | 24.9 0.4 |
| 18.2 | 38.21 - .14 | 27.4 - 0.2 | 34.05 - .15 | 36.4 - 0.3 | 27.09 - .89 | 76.8 - 0.6 | 37.28 - .16 | 24.5 - 0.5 |
| 28.2 | 38.07 .13 | 27.2 - 0.1 | 33.90 .14 | 36.2 - 0.1 | 26.21 .85 | 75.9 1.1 | 37.12 .16 | 24.0 0.5 |
| Mar. 10.1 | 37.95 .11 | 27.2 0.0 | 33.76 .13 | 36.1 0.0 | 25.39 .76 | 74.6 1.6 | 36.97 .14 | 23.4 0.5 |
| 20.1 | 37.84 .09 | 27.3 + 0.2 | 33.65 .10 | 36.2 + 0.2 | 24.68 .65 | 72.7 2.0 | 36.84 .12 | 22.9 0.5 |
| 30.1 | 37.77 .08 | 27.6 0.4 | 33.56 .07 | 36.4 0.4 | 24.10 .50 | 70.5 2.3 | 36.74 .08 | 22.4 0.4 |
| Apr. 9.1 | 37.74 - .08 | 28.1 + 0.6 | 33.51 - .08 | 36.9 + 0.6 | 23.68 - .33 | 68.0 - 2.6 | 36.68 - .04 | 22.0 - 0.3 |
| 19.0 | 37.74 + .03 | 28.9 0.8 | 33.50 + .01 | 37.6 0.8 | 23.44 - .15 | 65.4 2.7 | 36.65 .00 | 21.7 0.2 |
| 29.0 | 37.79 .06 | 29.8 1.0 | 33.53 .05 | 38.4 1.0 | 23.39 + .04 | 62.6 2.7 | 36.68 + .05 | 21.6 - 0.1 |
| May 9.0 | 37.89 .12 | 30.9 1.2 | 33.61 .10 | 39.5 1.2 | 23.53 .23 | 59.9 2.6 | 36.75 .10 | 21.6 + 0.1 |
| 19.0 | 38.03 .16 | 32.3 1.4 | 33.73 .14 | 40.7 1.3 | 23.85 .42 | 57.4 2.4 | 36.88 .15 | 21.8 0.3 |
| 28.9 | 38.21 + .20 | 33.8 + 1.6 | 33.90 + .18 | 42.2 + 1.5 | 24.36 + .58 | 55.0 - 2.2 | 37.05 + .19 | 22.2 + 0.5 |
| June 7.9 | 38.43 .24 | 35.5 1.7 | 34.10 .22 | 43.8 1.7 | 25.02 .74 | 53.0 1.9 | 37.26 .23 | 22.9 0.8 |
| 17.9 | 38.68 .27 | 37.3 1.8 | 34.34 .25 | 45.5 1.8 | 25.83 .87 | 51.3 1.5 | 37.51 .26 | 23.8 1.0 |
| 27.8 | 38.96 .29 | 39.2 1.9 | 34.61 .28 | 47.3 1.8 | 26.75 .97 | 50.0 1.0 | 37.79 .29 | 24.8 1.1 |
| July 7.8 | 39.26 .30 | 41.1 1.9 | 34.90 .29 | 49.1 1.8 | 27.77 1.05 | 49.2 0.6 | 38.09 .31 | 26.0 1.3 |
| 17.8 | 39.56 + .31 | 43.0 + 1.8 | 35.20 + .30 | 50.9 + 1.8 | 28.86 + 1.11 | 48.8 - 0.1 | 38.41 + .32 | 27.4 + 1.4 |
| 27.7 | 39.87 .31 | 44.7 1.7 | 35.51 .31 | 52.7 1.7 | 29.99 1.14 | 48.9 + 0.3 | 38.74 .33 | 28.8 1.4 |
| Aug. 6.7 | 40.18 .30 | 46.4 1.6 | 35.82 .31 | 54.3 1.6 | 31.15 1.15 | 49.5 0.8 | 39.07 .33 | 30.2 1.5 |
| 16.7 | 40.48 .29 | 47.9 1.4 | 36.12 .30 | 55.8 1.4 | 32.30 1.13 | 50.6 1.3 | 39.39 .29 | 31.7 1.5 |
| 26.7 | 40.76 .27 | 49.2 1.2 | 36.42 .28 | 57.1 1.2 | 33.42 1.10 | 52.1 1.7 | 39.70 .30 | 33.2 1.4 |
| Sept. 5.6 | 41.03 + .25 | 50.2 + 0.9 | 36.69 + .26 | 58.1 + 0.9 | 34.49 + 1.04 | 53.9 + 2.1 | 40.00 + .29 | 34.5 + 1.3 |
| 15.6 | 41.27 .23 | 51.0 0.7 | 36.94 .24 | 58.9 0.6 | 35.50 .97 | 56.2 2.4 | 40.28 .27 | 35.8 1.2 |
| 25.6 | 41.49 .20 | 51.6 0.4 | 37.18 .22 | 59.5 0.4 | 36.42 .87 | 58.8 2.7 | 40.54 .24 | 37.0 1.1 |
| Oct. 5.6 | 41.68 .17 | 51.8 + 0.2 | 37.38 .19 | 59.8 + 0.2 | 37.25 .76 | 61.7 3.0 | 40.77 .22 | 38.1 1.0 |
| 15.5 | 41.84 .15 | 51.9 - 0.1 | 37.56 .16 | 59.8 0.0 | 37.96 .64 | 64.8 3.2 | 40.97 .19 | 39.0 0.8 |
| 25.5 | 41.97 + .12 | 51.7 - 0.3 | 37.71 + .14 | 59.7 - 0.2 | 38.54 + .51 | 68.1 + 3.3 | 41.15 + .16 | 39.8 + 0.7 |
| Nov. 4.5 | 42.07 .09 | 51.4 0.4 | 37.83 .11 | 59.3 0.4 | 38.97 .35 | 71.5 3.4 | 41.29 .13 | 40.5 0.6 |
| 14.4 | 42.14 .06 | 50.9 0.5 | 37.92 .08 | 58.9 0.5 | 39.25 .20 | 74.9 3.4 | 41.41 .10 | 41.0 0.5 |
| 24.4 | 42.18 + .03 | 50.3 0.6 | 37.98 .05 | 58.3 0.6 | 39.36 + .03 | 78.3 3.3 | 41.49 .07 | 41.4 0.4 |
| Dec. 4.4 | 42.19 .00 | 49.6 0.7 | 38.01 + .02 | 57.6 0.7 | 39.30 - .14 | 81.5 3.1 | 41.54 + .03 | 41.8 0.3 |
| 14.4 | 42.17 - .03 | 48.9 - 0.7 | 38.01 - .02 | 56.9 - 0.7 | 39.08 - .31 | 84.6 + 2.9 | 41.55 .00 | 41.9 + 0.2 |
| 24.3 | 42.13 .02 | 48.2 0.7 | 37.98 .05 | 56.2 0.7 | 38.69 .47 | 87.2 2.5 | 41.53 - .04 | 42.0 + 0.1 |
| 34.3 | 42.06 - .02 | 47.5 - 0.6 | 37.91 - .08 | 55.6 - 0.6 | 38.15 - .02 | 89.5 + 2.0 | 41.47 - .08 | 42.0 0.0 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Persei. | | ϵ Eridani. | | δ Persei. | | γ Tauri. | |
|------------------------|----------------------------|---------------------------|----------------------------|---------------------------|---------------------------|---------------------------|----------------------------|--------------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 3 16 | ^m +49° 28' | ^h 3 27 | ^m — 9° 49' | ^h 3 35 | ^m +47° 26' | ^h 3 40 | ^m +23° 46' |
| (Dec.30.4) | ^s 32.41 —.13 | ^s 29.8 +1.2 | ^s 47.72 —.07 | ^s 44.7 —1.2 | ^s 9.88 —.09 | ^s 25.7 +1.2 | ^s 60.17 —.05 | ^s 5.6 +0.2 |
| Jan. 9.3 | 32.27 .16 | 30.9 0.9 | 47.64 .09 | 45.8 1.0 | 9.76 .13 | 26.8 1.0 | 60.11 .08 | 5.8 +0.1 |
| 19.3 | 32.08 .30 | 31.7 0.6 | 47.54 .12 | 46.7 0.8 | 9.61 .17 | 27.7 0.7 | 60.02 .11 | 5.8 0.0 |
| 29.3 | 31.86 .33 | 32.1 +0.2 | 47.41 .14 | 47.4 0.6 | 9.41 .31 | 28.2 +0.4 | 59.89 .14 | 5.8 —0.1 |
| Feb. 8.2 | 31.62 .35 | 32.1 —0.2 | 47.26 .15 | 47.9 0.3 | 9.18 .34 | 28.4 0.0 | 59.74 .16 | 5.6 0.2 |
| 18.2 | 31.36 —.36 | 31.7 —0.5 | 47.10 —.16 | 48.1 —0.1 | 8.94 —.35 | 28.1 —0.4 | 59.57 —.17 | 5.3 —0.3 |
| 28.2 | 31.10 .35 | 31.0 0.9 | 46.93 .16 | 48.1 +0.2 | 8.68 .34 | 27.6 0.7 | 59.40 .17 | 4.9 0.4 |
| Mar. 10.2 | 30.56 .33 | 29.9 1.2 | 46.78 .15 | 47.8 0.4 | 8.44 .33 | 26.8 1.0 | 59.23 .16 | 4.4 0.5 |
| 20.1 | 30.65 .19 | 28.6 1.4 | 46.63 .13 | 47.3 0.7 | 8.23 .30 | 25.6 1.2 | 59.08 .14 | 3.9 0.5 |
| 30.1 | 30.48 .14 | 27.1 1.6 | 46.51 .10 | 46.4 0.9 | 8.05 .16 | 24.3 1.4 | 58.95 .11 | 3.4 0.5 |
| Apr. 9.1 | 30.36 —.09 | 25.4 —1.7 | 46.43 —.07 | 45.4 +1.2 | 7.92 —.10 | 22.8 —1.5 | 58.85 —.07 | 2.9 —0.5 |
| 19.1 | 30.30 —.08 | 23.7 1.7 | 46.38 —.03 | 44.1 1.4 | 7.84 —.04 | 21.3 1.6 | 58.80 —.03 | 2.5 0.4 |
| 29.0 | 30.31 +.05 | 22.0 1.6 | 46.37 +.01 | 42.5 1.6 | 7.83 +.02 | 19.7 1.5 | 58.80 +.02 | 2.1 0.3 |
| May 9.0 | 30.39 .11 | 20.4 1.5 | 46.40 .06 | 40.8 1.8 | 7.88 .09 | 18.2 1.4 | 58.84 .07 | 1.9 —0.1 |
| 19.0 | 30.54 .18 | 19.0 1.3 | 46.49 .11 | 38.8 2.0 | 8.00 .15 | 16.8 1.3 | 58.93 .12 | 1.9 +0.1 |
| 28.9 | 30.75 +.34 | 17.8 —1.1 | 46.62 +.15 | 36.8 +2.1 | 8.19 +.21 | 15.7 —1.0 | 59.08 +.17 | 2.1 +0.2 |
| June 7.9 | 31.02 .30 | 16.9 0.8 | 46.79 .19 | 34.6 2.2 | 8.43 .27 | 14.7 0.8 | 59.27 .21 | 2.4 0.4 |
| 17.9 | 31.35 .35 | 16.2 0.5 | 47.00 .22 | 32.3 2.2 | 8.73 .32 | 14.1 0.5 | 59.50 .24 | 2.9 0.6 |
| 27.9 | 31.72 .36 | 15.9 —0.2 | 47.24 .25 | 30.0 2.2 | 9.07 .36 | 13.7 —0.2 | 59.76 .26 | 3.6 0.8 |
| July 7.8 | 32.12 .41 | 15.9 +0.2 | 47.50 .27 | 27.8 2.1 | 9.45 .39 | 13.6 +0.1 | 60.05 .30 | 4.5 1.0 |
| 17.8 | 32.54 +.43 | 16.3 +0.5 | 47.79 +.29 | 25.8 +2.0 | 9.85 +.41 | 13.8 +0.4 | 60.36 +.32 | 5.6 +1.1 |
| 27.8 | 32.98 .44 | 17.0 0.8 | 48.08 .30 | 23.9 1.8 | 10.27 .42 | 14.3 0.6 | 60.69 .33 | 6.7 1.2 |
| Aug. 6.8 | 33.43 .44 | 17.9 1.1 | 48.39 .30 | 22.2 1.6 | 10.70 .43 | 15.1 0.9 | 61.02 .33 | 7.9 1.2 |
| 16.7 | 33.87 .43 | 19.2 1.4 | 48.69 .29 | 20.7 1.3 | 11.13 .43 | 16.1 1.2 | 61.35 .33 | 9.1 1.3 |
| 26.7 | 34.30 .42 | 20.7 1.6 | 48.98 .29 | 19.7 0.9 | 11.55 .42 | 17.4 1.4 | 61.68 .29 | 10.4 1.2 |
| Sept. 5.7 | 34.71 +.40 | 22.4 +1.8 | 49.26 +.26 | 18.9 +0.6 | 11.96 +.40 | 18.9 +1.6 | 62.00 +.31 | 11.6 +1.2 |
| 15.6 | 35.10 .37 | 24.2 2.0 | 49.53 .26 | 18.5 +0.2 | 12.35 .38 | 20.5 1.7 | 62.30 .29 | 12.8 1.1 |
| 25.6 | 35.46 .34 | 26.2 2.1 | 49.78 .23 | 18.5 —0.2 | 12.72 .35 | 22.3 1.8 | 62.58 .27 | 13.9 1.1 |
| Oct. 5.6 | 35.78 .31 | 28.4 2.2 | 50.00 .21 | 18.9 0.5 | 13.06 .32 | 24.2 1.9 | 62.84 .25 | 14.9 1.0 |
| 15.6 | 36.07 .27 | 30.6 2.2 | 50.20 .18 | 19.5 0.8 | 13.36 .29 | 26.2 2.0 | 63.08 .23 | 15.8 0.9 |
| 25.5 | 36.32 +.23 | 32.8 +2.3 | 50.38 +.16 | 20.5 —1.1 | 13.63 +.25 | 28.2 +2.0 | 63.30 +.20 | 16.7 +0.8 |
| Nov. 4.5 | 36.53 .18 | 25.1 2.2 | 50.52 .13 | 21.6 1.3 | 13.86 .20 | 30.3 2.0 | 63.48 .17 | 17.4 0.7 |
| 14.5 | 36.69 .13 | 27.3 2.2 | 50.63 .10 | 23.0 1.4 | 14.04 .16 | 32.3 2.0 | 63.63 .14 | 18.0 0.6 |
| 24.5 | 36.80 .08 | 39.4 2.1 | 50.71 .06 | 24.4 1.5 | 14.18 .11 | 34.3 1.9 | 63.75 .10 | 18.6 0.5 |
| Dec. 4.4 | 36.86 +.03 | 41.4 1.9 | 50.76 +.03 | 25.9 1.5 | 14.26 .06 | 36.2 1.8 | 63.84 .06 | 19.1 0.4 |
| 14.4 | 36.96 —.02 | 43.2 +1.7 | 50.77 .00 | 27.3 —1.4 | 14.30 +.01 | 37.9 +1.6 | 63.88 +.03 | 19.4 +0.3 |
| 24.4 | 36.81 .06 | 44.8 1.4 | 50.75 —.03 | 28.7 1.3 | 14.28 —.05 | 39.5 1.4 | 63.89 —.01 | 19.7 0.2 |
| 34.4 | 36.70 —.13 | 46.1 +1.1 | 50.69 —.07 | 29.9 —1.1 | 14.20 —.10 | 40.8 +1.2 | 63.86 —.05 | 19.9 +0.1 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | ζ Persei. | | γ Eridani. | | γ Tauri. | | ε Tauri. | |
|------------------------|--------------------------------------|-----------------------|--------------------------------------|-----------------------|--------------------------------------|-----------------------|--------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 3 ^m 47 | +31° 33' | ^h 3 ^m 52 | —13° 46' | ^h 4 ^m 13 | +15° 21' | ^h 4 ^m 22 | +18° 56' |
| (Dec. 30.4) | 16.75 —.05 | 37.6 +0.6 | 56.86 —.06 | 74.4 —1.5 | 35.46 —.01 | 51.0 —0.2 | 15.15 —.01 | 18.8 0.0 |
| Jan. 9.3 | 16.69 .06 | 38.1 0.4 | 56.80 .06 | 75.8 1.2 | 35.43 .05 | 50.8 0.2 | 15.13 .05 | 18.8 0.0 |
| 19.3 | 16.59 .11 | 38.4 0.3 | 56.70 .11 | 76.9 1.0 | 35.36 .09 | 50.6 0.2 | 15.06 .08 | 18.7 —0.1 |
| 29.3 | 16.45 .15 | 38.6 +0.1 | 56.57 .14 | 77.8 0.7 | 35.26 .12 | 50.3 0.2 | 14.96 .12 | 18.6 0.1 |
| Feb. 8.3 | 16.28 .17 | 38.6 —0.1 | 56.42 .16 | 78.4 0.5 | 35.12 .14 | 50.1 0.2 | 14.83 .15 | 18.5 0.1 |
| 18.2 | 16.10 —.19 | 38.4 —0.3 | 56.26 —.17 | 78.8 —0.2 | 34.97 —.16 | 49.9 —0.2 | 14.67 —.16 | 18.3 —0.2 |
| 28.2 | 15.91 .19 | 38.0 0.5 | 56.08 .17 | 78.8 +0.1 | 34.80 .17 | 49.7 0.2 | 14.50 .17 | 18.1 0.2 |
| Mar. 10.2 | 15.73 .18 | 37.4 0.6 | 55.91 .16 | 78.5 0.4 | 34.63 .16 | 49.4 0.2 | 14.33 .17 | 17.9 0.2 |
| 20.2 | 15.56 .16 | 36.7 0.7 | 55.75 .15 | 77.9 0.7 | 34.47 .15 | 49.3 0.2 | 14.16 .16 | 17.7 0.2 |
| 30.1 | 15.41 .13 | 36.0 0.8 | 55.62 .12 | 77.1 1.0 | 34.33 .13 | 49.1 —0.1 | 14.01 .13 | 17.4 0.2 |
| Apr. 9.1 | 15.31 —.06 | 35.2 —0.8 | 55.51 —.09 | 75.9 +1.3 | 34.22 —.09 | 49.0 0.0 | 13.90 —.10 | 17.2 —0.2 |
| 19.1 | 15.24 —.04 | 34.4 0.8 | 55.43 .05 | 74.5 1.5 | 34.15 .05 | 49.0 +0.1 | 13.81 .06 | 17.1 —0.1 |
| 29.0 | 15.23 +0.1 | 33.6 0.7 | 55.40 —.01 | 72.8 1.8 | 34.11 —.01 | 49.2 0.2 | 13.77 —.08 | 17.0 0.0 |
| May 9.0 | 15.27 .06 | 33.0 0.6 | 55.41 +0.3 | 71.0 2.0 | 34.12 +0.4 | 49.4 0.3 | 13.77 +0.3 | 17.1 +0.1 |
| 19.0 | 15.36 .12 | 32.5 0.4 | 55.47 .08 | 68.9 2.1 | 34.18 .08 | 49.8 0.5 | 13.83 .08 | 17.3 0.3 |
| 29.0 | 15.51 +.17 | 32.2 —0.2 | 55.57 +.12 | 66.7 +2.3 | 34.29 +.13 | 50.4 +0.6 | 13.93 +.12 | 17.6 +0.4 |
| June 7.9 | 15.70 .21 | 32.0 0.0 | 55.72 .17 | 64.3 2.4 | 34.44 .17 | 51.1 0.8 | 14.07 .17 | 18.1 0.5 |
| 17.9 | 15.94 .25 | 32.1 +0.2 | 55.90 .21 | 62.0 2.4 | 34.63 .21 | 52.0 0.9 | 14.26 .21 | 18.7 0.7 |
| 27.9 | 16.21 .29 | 32.4 0.4 | 56.13 .24 | 59.6 2.3 | 34.86 .24 | 53.0 1.0 | 14.48 .24 | 19.4 0.8 |
| July 7.9 | 16.52 .32 | 32.9 0.6 | 56.38 .26 | 57.3 2.2 | 35.11 .27 | 54.0 1.1 | 14.74 .27 | 20.3 0.9 |
| 17.8 | 16.85 +.34 | 33.6 +0.8 | 56.65 +.28 | 55.1 +2.1 | 35.39 +.29 | 55.2 +1.2 | 15.02 +.29 | 21.3 +1.0 |
| 27.8 | 17.19 .35 | 34.4 0.9 | 56.94 .29 | 53.1 1.9 | 35.69 .30 | 56.4 1.2 | 15.32 .31 | 22.3 1.0 |
| Aug. 6.8 | 17.54 .35 | 35.4 1.0 | 57.24 .30 | 51.3 1.6 | 36.00 .31 | 57.6 1.2 | 15.63 .32 | 23.3 1.0 |
| 16.7 | 17.90 .35 | 36.5 1.1 | 57.55 .30 | 49.9 1.3 | 36.31 .31 | 58.7 1.1 | 15.95 .32 | 24.4 1.0 |
| 26.7 | 18.25 .34 | 37.7 1.2 | 57.85 .30 | 48.8 0.9 | 36.62 .31 | 59.8 1.0 | 16.27 .32 | 25.4 1.0 |
| Sept. 5.7 | 18.59 +.33 | 39.0 +1.3 | 58.14 +.29 | 48.1 +0.5 | 36.93 +.30 | 60.7 +0.9 | 16.59 +.31 | 26.3 +0.9 |
| 15.7 | 18.91 .31 | 40.3 1.3 | 58.42 .27 | 47.8 +0.1 | 37.23 .29 | 61.6 0.8 | 16.89 .30 | 27.1 0.8 |
| 25.6 | 19.22 .29 | 41.5 1.3 | 58.68 .25 | 47.8 —0.2 | 37.52 .28 | 62.3 0.6 | 17.19 .29 | 27.8 0.7 |
| Oct. 5.6 | 19.50 .27 | 42.8 1.2 | 58.93 .23 | 48.3 0.6 | 37.79 .26 | 62.8 0.4 | 17.47 .27 | 28.4 0.5 |
| 15.6 | 19.77 .25 | 44.0 1.2 | 59.15 .21 | 49.2 1.0 | 38.04 .24 | 63.2 0.3 | 17.74 .25 | 28.9 0.4 |
| 25.6 | 20.00 +.22 | 45.2 +1.2 | 59.35 +.18 | 50.3 —1.3 | 38.27 +.22 | 63.4 +0.2 | 17.98 +.23 | 29.3 +0.3 |
| Nov. 4.5 | 20.20 .19 | 46.4 1.1 | 59.51 .15 | 51.7 1.5 | 38.48 .19 | 63.5 +0.1 | 18.20 .20 | 29.6 0.2 |
| 14.5 | 20.37 .16 | 47.5 1.1 | 59.65 .12 | 53.3 1.7 | 38.66 .16 | 63.5 0.0 | 18.39 .17 | 29.7 0.1 |
| 24.5 | 20.51 .12 | 48.5 1.0 | 59.75 .09 | 55.0 1.7 | 38.80 .13 | 63.4 —0.1 | 18.55 .14 | 29.8 +0.1 |
| Dec. 4.4 | 20.60 .07 | 49.4 0.9 | 59.82 .05 | 56.8 1.7 | 38.92 .10 | 63.3 0.2 | 18.67 .11 | 29.9 0.0 |
| 14.4 | 20.66 +0.3 | 50.2 +0.8 | 59.86 +0.2 | 58.6 —1.7 | 38.99 +0.6 | 63.2 —0.2 | 18.76 +0.6 | 29.9 0.0 |
| 24.4 | 20.67 —0.1 | 51.0 0.7 | 59.85 —0.2 | 60.2 1.6 | 39.03 +0.2 | 63.0 0.2 | 18.80 +0.2 | 29.9 0.0 |
| 34.4 | 20.63 —0.6 | 51.6 +0.5 | 59.81 —0.6 | 61.7 —1.4 | 39.02 —0.2 | 62.8 —0.2 | 18.81 —0.2 | 29.9 0.0 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Tauri. (Aldebaran.) | | α Camelopardalis. | | ϵ Aurigæ. | | ι Orionis. | |
|------------------------|-----------------------------------|-------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h ^m 4 29 | [°] ['] +16 17 | ^h ^m 4 43 | [°] ['] +66 9 | ^h ^m 4 49 | [°] ['] +32 59 | ^h ^m 4 58 | [°] ['] +15 15 |
| (Dec. 30.4) | ^s 40.05 +.01 | 23.8 -0.1 | ^s 13.71 -.08 | 31.4 +2.5 | ^s 53.90 +.01 | 38.2 +0.8 | ^s 20.58 +.02 | " -0.3 |
| Jan. 9.4 | 40.03 -.04 | 23.6 0.2 | 13.61 .15 | 33.8 2.2 | 53.89 -.03 | 39.0 0.7 | 20.59 -.02 | 7.1 0.2 |
| 19.4 | 39.97 .08 | 23.5 0.2 | 13.40 .25 | 35.8 1.9 | 53.84 .08 | 39.6 0.6 | 20.55 .06 | 6.9 0.2 |
| 29.4 | 39.87 .11 | 23.3 0.2 | 13.11 .33 | 37.6 1.5 | 53.74 .12 | 40.1 0.4 | 20.47 .10 | 6.7 0.2 |
| Feb. 8.3 | 39.74 .14 | 23.1 0.2 | 12.74 .39 | 38.8 1.0 | 53.60 .16 | 40.5 0.3 | 20.36 .13 | 6.6 0.1 |
| 18.3 | 39.59 -.16 | 23.0 -0.2 | 12.32 -.44 | 39.7 +0.6 | 53.42 -.18 | 40.7 +0.1 | 20.21 -.15 | 6.4 -0.1 |
| 28.2 | 39.42 .17 | 22.8 0.2 | 11.87 .46 | 40.0 +0.1 | 53.23 .20 | 40.8 -0.1 | 20.05 .17 | 6.3 0.1 |
| Mar. 10.2 | 39.25 .17 | 22.6 0.2 | 11.40 .46 | 39.9 -0.4 | 53.03 .20 | 40.6 0.2 | 19.88 .17 | 6.2 0.1 |
| 20.2 | 39.09 .16 | 22.4 0.2 | 10.95 .43 | 39.2 0.8 | 52.83 .19 | 40.3 0.4 | 19.70 .16 | 6.1 -0.1 |
| 30.2 | 38.94 .14 | 22.3 -0.1 | 10.51 .39 | 38.2 1.2 | 52.65 .17 | 39.9 0.5 | 19.54 .15 | 6.1 0.0 |
| Apr. 9.1 | 38.82 -.11 | 22.2 0.0 | 10.18 -.32 | 36.7 -1.6 | 52.50 -.14 | 39.3 -0.6 | 19.40 -.12 | 6.1 0.0 |
| 19.1 | 38.73 .07 | 22.2 0.0 | 9.90 .24 | 34.9 1.9 | 52.38 .09 | 38.7 0.7 | 19.30 .09 | 6.1 +0.1 |
| 29.1 | 38.68 -.02 | 22.2 +0.1 | 9.70 .14 | 32.9 2.1 | 52.31 -.05 | 38.0 0.7 | 19.23 -.05 | 6.3 0.2 |
| May 9.1 | 38.68 +.02 | 22.4 0.3 | 9.61 -.04 | 30.7 2.2 | 52.28 .00 | 37.3 0.7 | 19.20 .00 | 6.5 0.3 |
| 19.0 | 38.72 .07 | 22.8 0.4 | 9.62 +.06 | 28.5 2.2 | 52.31 +.05 | 36.7 0.6 | 19.22 +.04 | 6.8 0.4 |
| 29.0 | 38.81 +.11 | 23.2 +0.5 | 9.73 +.16 | 26.3 -2.2 | 52.39 +.11 | 36.1 -0.5 | 19.28 +.09 | 7.3 +0.5 |
| June 8.0 | 38.95 .16 | 23.8 0.7 | 9.94 .26 | 24.1 2.1 | 52.52 .16 | 35.7 0.4 | 19.39 .13 | 7.9 0.6 |
| 17.9 | 39.12 .20 | 24.5 0.8 | 10.25 .36 | 22.1 1.9 | 52.70 .20 | 35.4 0.2 | 19.54 .17 | 8.6 0.7 |
| 27.9 | 39.34 .23 | 25.4 0.9 | 10.65 .44 | 20.3 1.7 | 52.93 .24 | 35.2 -0.1 | 19.73 .21 | 9.4 0.8 |
| July 7.9 | 39.58 .26 | 26.4 1.0 | 11.13 .51 | 18.8 1.4 | 53.19 .28 | 35.2 +0.1 | 19.95 .24 | 10.3 0.9 |
| 17.9 | 39.86 +.28 | 27.4 +1.0 | 11.67 +.57 | 17.6 -1.1 | 53.48 +.31 | 35.3 +0.2 | 20.20 +.26 | 11.2 +0.9 |
| 27.8 | 40.15 .30 | 28.4 1.1 | 12.26 .61 | 16.7 0.7 | 53.80 .33 | 35.6 0.3 | 20.48 .28 | 12.2 1.0 |
| Aug. 6.8 | 40.45 .31 | 29.5 1.1 | 12.90 .65 | 16.1 -0.4 | 54.14 .34 | 36.0 0.5 | 20.77 .30 | 13.1 0.9 |
| 16.8 | 40.77 .31 | 30.6 1.0 | 13.56 .67 | 15.9 0.0 | 54.48 .35 | 36.5 0.6 | 21.07 .31 | 14.0 0.9 |
| 26.8 | 41.08 .31 | 31.5 0.9 | 14.24 .68 | 16.1 +0.3 | 54.84 .35 | 37.1 0.6 | 21.38 .31 | 14.9 0.8 |
| Sept. 5.7 | 41.39 +.31 | 32.4 +0.8 | 14.92 +.68 | 16.6 +0.7 | 55.19 +.35 | 37.8 +0.7 | 21.69 +.31 | 15.6 +0.6 |
| 15.7 | 41.70 .30 | 33.2 0.7 | 15.60 .67 | 17.4 1.0 | 55.55 .35 | 38.5 0.7 | 22.00 .30 | 16.2 0.5 |
| 25.7 | 41.99 .29 | 33.8 0.5 | 16.27 .65 | 18.6 1.3 | 55.89 .34 | 39.3 0.8 | 22.30 .30 | 16.6 0.4 |
| Oct. 5.6 | 42.28 .27 | 34.3 0.4 | 16.90 .62 | 20.1 1.6 | 56.22 .32 | 40.0 0.8 | 22.59 .29 | 16.9 0.2 |
| 15.6 | 42.54 .25 | 34.6 0.3 | 17.50 .58 | 21.9 1.9 | 56.54 .30 | 40.8 0.8 | 22.87 .27 | 17.1 +0.1 |
| 25.6 | 42.78 +.23 | 34.8 +0.1 | 18.06 +.53 | 24.0 +2.2 | 56.84 +.28 | 41.6 +0.8 | 23.14 +.25 | 17.1 0.0 |
| Nov. 4.6 | 43.00 .21 | 34.9 0.0 | 18.56 .46 | 26.2 2.4 | 57.11 .26 | 42.5 0.8 | 23.38 .23 | 17.0 -0.1 |
| 14.5 | 43.20 .18 | 34.9 -0.1 | 18.98 .39 | 28.7 2.5 | 57.36 .23 | 43.3 0.8 | 23.60 .21 | 16.8 0.2 |
| 24.5 | 43.36 .15 | 34.8 0.1 | 19.34 .31 | 31.3 2.6 | 57.57 .19 | 44.2 0.8 | 23.79 .18 | 16.5 0.3 |
| Dec. 4.5 | 43.49 .11 | 34.7 0.1 | 19.60 .22 | 34.0 2.7 | 57.74 .15 | 45.0 0.8 | 23.95 .14 | 16.2 0.3 |
| 14.5 | 43.59 +.07 | 34.5 -0.2 | 19.77 +.12 | 36.7 +2.6 | 57.86 +.10 | 45.8 +0.8 | 24.07 +.10 | 16.0 -0.3 |
| 24.4 | 43.64 +.03 | 34.3 0.2 | 19.83 +.01 | 39.4 2.5 | 57.94 +.05 | 46.6 0.8 | 24.15 +.06 | 15.7 0.3 |
| 34.4 | 43.65 -.01 | 34.2 -0.2 | 19.79 -.09 | 41.8 +2.4 | 57.97 .00 | 47.4 +0.8 | 24.19 .00 | 15.4 -0.3 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | <i>α Aurigæ. (Capella.)</i> | | <i>β Orionis. (Rigel.)</i> | | <i>β Tauri.</i> | | Groombridge 966. | |
|------------------------|---|--------------------------|---|--------------------------|----------------------------------|--------------------------|---------------------|--------------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 5 | ^m 8 | ^h 5 | ^m 9 | ^h 5 | ^m 19 | ^h 5 | ^m 25 |
| | | ^s +45° 53' | | ^s — 8° 19' | | ^s +28° 30' | | ^s +74° 58' |
| (Dec. 30.4) | 38.59 +.02 | 15.9 +1.5 | 18.32 +.01 | 42.8 —1.5 | 24.32 +.04 | 55.8 +0.5 | 11.93— .01 | 19.5 +2.9 |
| Jan. 9.4 | 38.59 —.03 | 17.4 1.4 | 18.32 —.02 | 44.3 1.4 | 24.35 .00 | 56.4 0.5 | 11.86 .15 | 22.4 2.7 |
| 19.4 | 38.54 .08 | 18.7 1.3 | 18.28 .00 | 45.6 1.3 | 24.33 —.05 | 56.9 0.4 | 11.62 .31 | 25.1 2.5 |
| 29.4 | 38.42 .14 | 19.8 1.0 | 18.19 .10 | 46.7 1.0 | 24.26 .09 | 57.3 0.4 | 11.24 .45 | 27.4 2.2 |
| Feb. 8.3 | 38.26 .18 | 20.7 0.8 | 18.08 .13 | 47.5 0.7 | 24.14 .13 | 57.6 0.3 | 10.72 .57 | 29.4 1.7 |
| 18.3 | 38.05 —.22 | 21.4 +0.5 | 17.93 —.16 | 48.1 —0.5 | 23.99 —.16 | 57.9 +0.2 | 10.10— .06 | 30.8 +1.2 |
| 28.3 | 37.82 .24 | 21.7 +0.3 | 17.76 .17 | 48.5 —0.3 | 23.82 .18 | 58.0 +0.1 | 9.39 .79 | 31.8 0.7 |
| Mar. 10.2 | 37.57 .25 | 21.7 —0.1 | 17.58 .18 | 48.6 0.0 | 23.63 .19 | 58.1 0.0 | 8.65 .75 | 32.3 +0.2 |
| 20.2 | 37.32 .24 | 21.5 0.4 | 17.41 .17 | 48.4 +0.3 | 23.44 .18 | 58.0 —0.1 | 7.90 .74 | 32.2 —0.4 |
| 30.2 | 37.09 .22 | 20.9 0.7 | 17.24 .16 | 48.0 0.5 | 23.26 .17 | 57.8 0.2 | 7.18 .09 | 31.5 0.9 |
| Apr. 9.2 | 36.89 —.19 | 20.1 —0.9 | 17.09 —.14 | 47.4 +0.8 | 23.09 —.15 | 57.5 —0.3 | 6.52— .61 | 30.4 —1.4 |
| 19.1 | 36.72 .14 | 19.1 1.1 | 16.97 .11 | 46.5 1.0 | 22.96 .11 | 57.1 0.4 | 5.95 .51 | 28.8 1.8 |
| 29.1 | 36.61 .09 | 18.0 1.2 | 16.83 .07 | 45.4 1.2 | 22.87 .07 | 56.7 0.4 | 5.50 .38 | 26.9 2.1 |
| May 9.1 | 36.55 —.03 | 16.7 1.3 | 16.83 —.03 | 44.0 1.4 | 22.82 —.02 | 56.3 0.4 | 5.19 .24 | 24.6 2.3 |
| 19.1 | 36.55 +.03 | 15.4 1.3 | 16.82 +.01 | 42.5 1.6 | 22.82 +.02 | 55.9 0.4 | 5.02— .09 | 22.2 2.5 |
| 29.0 | 36.61 +.09 | 14.1 —1.3 | 16.86 +.06 | 40.7 +1.8 | 22.87 +.07 | 55.6 —0.3 | 5.01+ .06 | 19.7 —2.6 |
| June 8.0 | 36.74 .15 | 12.9 1.2 | 16.94 .10 | 38.9 1.9 | 22.97 .12 | 55.3 0.2 | 5.15 .22 | 17.1 2.5 |
| 18.0 | 36.92 .21 | 11.8 1.0 | 17.06 .14 | 36.9 2.0 | 23.11 .17 | 55.1 —0.1 | 5.44 .37 | 14.6 2.4 |
| 27.9 | 37.16 .26 | 10.8 0.9 | 17.22 .18 | 34.9 2.0 | 23.30 .21 | 55.1 0.0 | 5.88 .50 | 12.2 2.3 |
| July 7.9 | 37.44 .30 | 10.0 0.7 | 17.41 .21 | 32.9 2.0 | 23.53 .24 | 55.1 +0.1 | 6.45 .03 | 10.0 2.1 |
| 17.9 | 37.77 +.34 | 9.3 —0.5 | 17.63 +.23 | 30.9 +1.9 | 23.78 +.27 | 55.3 +0.2 | 7.14+ .74 | 8.0 —1.8 |
| 27.9 | 38.12 .37 | 8.9 0.3 | 17.88 .25 | 29.1 1.7 | 24.07 .30 | 55.5 0.3 | 7.93 .24 | 6.3 1.5 |
| Aug. 6.8 | 38.51 .39 | 8.7 —0.1 | 18.14 .27 | 27.4 1.5 | 24.38 .32 | 55.8 0.3 | 8.81 .21 | 4.9 1.2 |
| 16.8 | 38.91 .41 | 8.6 +0.1 | 18.42 .28 | 26.0 1.3 | 24.70 .33 | 56.2 0.4 | 9.76 .27 | 3.9 0.8 |
| 26.8 | 39.32 .42 | 8.8 0.2 | 18.71 .29 | 24.8 1.0 | 25.03 .34 | 56.6 0.4 | 10.76 1.02 | 3.3 —0.4 |
| Sept. 5.8 | 39.75 +.42 | 9.1 +0.4 | 19.00 +.29 | 24.0 +0.7 | 25.37 +.34 | 57.1 +0.4 | 11.79+1.04 | 3.1 0.0 |
| 15.7 | 40.17 .42 | 9.6 0.6 | 19.30 .29 | 23.5 +0.3 | 25.71 .34 | 57.5 0.4 | 12.84 1.05 | 3.2 +0.4 |
| 25.7 | 40.58 .41 | 10.3 0.7 | 19.58 .28 | 23.3 —0.1 | 26.05 .33 | 58.0 0.4 | 13.88 1.04 | 3.8 0.8 |
| Oct. 5.7 | 40.99 .40 | 11.1 0.9 | 19.86 .27 | 23.6 0.4 | 26.38 .32 | 58.4 0.4 | 14.91 1.01 | 4.8 1.1 |
| 15.6 | 41.38 .38 | 12.1 1.0 | 20.13 .26 | 24.2 0.8 | 26.70 .31 | 58.8 0.4 | 15.90 .26 | 6.1 1.5 |
| 25.6 | 41.74 +.35 | 13.2 +1.2 | 20.39 +.24 | 25.1 —1.1 | 27.01 +.30 | 59.2 +0.4 | 16.84+ .20 | 7.8 +1.9 |
| Nov. 4.6 | 42.09 .33 | 14.4 1.3 | 20.62 .22 | 26.4 1.3 | 27.29 .27 | 59.6 0.4 | 17.70 .21 | 9.9 2.2 |
| 14.6 | 42.40 .29 | 15.8 1.4 | 20.83 .19 | 27.8 1.5 | 27.56 .25 | 60.0 0.4 | 18.46 .71 | 12.2 2.5 |
| 24.5 | 42.67 .24 | 17.2 1.5 | 21.01 .16 | 29.4 1.6 | 27.79 .22 | 60.4 0.4 | 19.11 .58 | 14.9 2.7 |
| Dec. 4.5 | 42.89 .19 | 18.8 1.5 | 21.16 .13 | 31.1 1.7 | 27.99 .18 | 60.8 0.5 | 19.63 .44 | 17.7 2.9 |
| 14.5 | 43.06 +.14 | 20.3 +1.6 | 21.27 +.09 | 32.8 —1.7 | 28.14 +.13 | 61.3 +0.5 | 20.00+ .29 | 20.6 +3.0 |
| 24.5 | 43.17 .08 | 21.9 1.5 | 21.34 +.05 | 34.5 1.6 | 28.25 .08 | 61.8 0.5 | 20.21+ .13 | 23.6 2.9 |
| 34.4 | 43.22 +.01 | 23.4 +1.4 | 21.37 .00 | 36.1 —1.5 | 28.32 +.03 | 62.3 +0.5 | 20.25— .04 | 26.5 +2.8 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | δ Orionis. | | α Leporis. | | ϵ Orionis. | | α Columbæ. | |
|------------------------|-----------------------------------|-----------------------|-----------------------------------|-----------------------|-----------------------------------|-----------------------|-----------------------------------|-----------------------|
| | Right Ascension. | Declination South. | Right Ascension. | Declination South. | Right Ascension. | Declination South. | Right Ascension. | Declination South. |
| | ^h ^m 5 26 | — 0° 22' | ^h ^m 5 27 | — 17° 53' | ^h ^m 5 30 | — 1° 16' | ^h ^m 5 35 | — 34° 7' |
| (Dec. 30.4) | ^s 26.59 +.04 | 49.5 — 1.2 | ^s 55.89 +.02 | 64.6 — 2.0 | ^s 41.27 +.04 | 19.5 — 1.3 | ^s 43.09 .00 | 60.1 — 2.7 |
| Jan. 9.4 | 26.62 .00 | 50.7 1.1 | 55.90 —.02 | 66.6 1.9 | 41.30 .00 | 20.7 1.1 | 43.07 —.05 | 62.8 2.5 |
| 19.4 | 26.59 —.04 | 51.7 0.9 | 55.85 .06 | 68.4 1.7 | 41.28 —.04 | 21.8 0.9 | 43.00 .09 | 65.1 2.2 |
| 29.4 | 26.53 .08 | 52.5 0.7 | 55.77 .10 | 69.9 1.4 | 41.21 .08 | 22.7 0.8 | 42.88 .14 | 67.2 1.9 |
| Feb. 8.3 | 26.42 .19 | 53.2 0.6 | 55.64 .14 | 71.1 1.1 | 41.11 .12 | 23.4 0.6 | 42.72 .18 | 68.8 1.4 |
| 18.3 | 26.29 —.15 | 53.7 — 0.4 | 55.49 —.17 | 72.0 — 0.7 | 40.98 —.14 | 23.9 — 0.4 | 42.53 —.21 | 70.1 — 1.0 |
| 28.3 | 26.13 .16 | 54.0 — 0.2 | 55.32 .18 | 72.6 — 0.4 | 40.82 .16 | 24.2 — 0.2 | 42.31 .23 | 70.9 0.6 |
| Mar. 10.3 | 25.96 .17 | 54.1 0.0 | 55.12 .19 | 72.8 0.0 | 40.65 .17 | 24.4 0.0 | 42.07 .24 | 71.2 — 0.1 |
| 20.2 | 25.79 .17 | 54.1 + 0.1 | 54.93 .19 | 72.7 + 0.3 | 40.48 .17 | 24.3 + 0.1 | 41.83 .24 | 71.1 + 0.3 |
| 30.2 | 25.62 .16 | 53.8 0.3 | 54.74 .18 | 72.2 0.6 | 40.31 .16 | 24.1 0.3 | 41.60 .23 | 70.6 0.8 |
| Apr. 9.2 | 25.47 —.14 | 53.4 + 0.5 | 54.57 —.16 | 71.4 + 0.9 | 40.16 —.14 | 23.7 + 0.5 | 41.38 —.21 | 69.6 + 1.2 |
| 19.1 | 25.35 .11 | 52.8 0.7 | 54.43 .13 | 70.3 1.2 | 40.03 .11 | 23.1 0.7 | 41.18 .18 | 68.2 1.6 |
| 29.1 | 25.25 .07 | 52.0 0.9 | 54.31 .09 | 69.0 1.5 | 39.93 .08 | 22.3 0.9 | 41.03 .14 | 66.4 1.9 |
| May 9.1 | 25.20 —.04 | 51.1 1.0 | 54.24 .05 | 67.3 1.8 | 39.87 —.04 | 21.3 1.1 | 40.91 .10 | 64.3 2.2 |
| 19.1 | 25.18 .00 | 50.0 1.2 | 54.20 —.01 | 65.4 2.0 | 39.85 .00 | 20.2 1.2 | 40.83 —.05 | 61.9 2.5 |
| 29.0 | 25.21 +.05 | 48.7 + 1.3 | 54.21 +.03 | 63.3 + 2.9 | 39.88 +.04 | 18.9 + 1.4 | 40.80 .00 | 59.2 + 2.7 |
| June 8.0 | 25.28 .09 | 47.4 1.4 | 54.26 .07 | 61.1 2.3 | 39.94 .08 | 17.4 1.5 | 40.82 +.04 | 56.4 2.9 |
| 18.0 | 25.39 .13 | 45.9 1.5 | 54.36 .11 | 58.7 2.4 | 40.05 .12 | 15.9 1.6 | 40.89 .09 | 53.4 3.0 |
| 28.0 | 25.54 .17 | 44.3 1.6 | 54.49 .15 | 56.3 2.4 | 40.19 .16 | 14.3 1.6 | 41.01 .14 | 50.4 3.0 |
| July 7.9 | 25.72 .20 | 42.7 1.6 | 54.66 .19 | 53.9 2.3 | 40.37 .19 | 12.7 1.6 | 41.17 .18 | 47.4 2.9 |
| 17.9 | 25.94 +.23 | 41.1 + 1.5 | 54.87 +.22 | 51.6 + 2.2 | 40.58 +.22 | 11.1 + 1.6 | 41.37 +.22 | 44.6 + 2.7 |
| 27.9 | 26.18 .25 | 39.6 1.4 | 55.10 .24 | 49.4 2.0 | 40.82 .24 | 9.6 1.5 | 41.60 .25 | 41.9 2.5 |
| Aug. 6.8 | 26.44 .27 | 38.2 1.3 | 55.35 .26 | 47.4 1.8 | 41.08 .26 | 8.2 1.3 | 41.86 .27 | 39.6 2.2 |
| 16.8 | 26.71 .28 | 37.0 1.1 | 55.63 .28 | 45.8 1.5 | 41.35 .28 | 6.9 1.1 | 42.14 .29 | 37.5 1.9 |
| 26.8 | 27.00 .29 | 36.0 0.9 | 55.91 .29 | 44.4 1.9 | 41.63 .29 | 5.9 0.9 | 42.45 .31 | 35.9 1.3 |
| Sept. 5.8 | 27.29 +.29 | 35.2 + 0.6 | 56.20 +.30 | 43.5 + 0.7 | 41.92 +.29 | 5.1 + 0.6 | 42.76 +.32 | 34.8 + 0.8 |
| 15.7 | 27.58 .29 | 34.8 + 0.3 | 56.50 .30 | 43.0 + 0.3 | 42.21 .29 | 4.6 + 0.3 | 43.09 .32 | 34.3 + 0.3 |
| 25.7 | 27.87 .29 | 34.6 0.0 | 56.80 .29 | 42.9 — 0.2 | 42.51 .29 | 4.5 0.0 | 43.41 .32 | 34.3 — 0.3 |
| Oct. 5.7 | 28.16 .28 | 34.7 — 0.3 | 57.09 .28 | 43.3 0.6 | 42.79 .28 | 4.6 — 0.3 | 43.73 .31 | 34.8 0.8 |
| 15.7 | 28.44 .27 | 35.1 0.5 | 57.37 .27 | 44.1 1.0 | 43.07 .27 | 5.1 0.6 | 44.04 .30 | 35.9 1.3 |
| 25.6 | 28.71 +.26 | 35.8 — 0.8 | 57.64 +.26 | 45.4 — 1.4 | 43.34 +.26 | 5.8 — 0.8 | 44.33 +.28 | 37.5 — 1.8 |
| Nov. 4.6 | 28.96 .24 | 36.7 1.0 | 57.88 .24 | 47.0 1.7 | 43.59 .24 | 6.7 1.0 | 44.60 .25 | 39.6 2.2 |
| 14.6 | 29.18 .21 | 37.8 1.2 | 58.11 .21 | 48.8 2.0 | 43.82 .22 | 7.9 1.2 | 44.83 .28 | 42.0 2.5 |
| 24.5 | 29.38 .18 | 39.0 1.3 | 58.30 .18 | 50.9 2.2 | 44.03 .19 | 9.2 1.3 | 45.03 .18 | 44.7 2.8 |
| Dec. 4.5 | 29.56 .15 | 40.4 1.3 | 58.46 .14 | 53.2 2.3 | 44.20 .16 | 10.6 1.4 | 45.19 .14 | 47.6 2.9 |
| 14.5 | 29.69 +.11 | 41.7 — 1.3 | 58.58 +.10 | 55.4 — 2.2 | 44.34 +.12 | 12.0 — 1.4 | 45.31 +.09 | 50.5 — 2.9 |
| 24.5 | 29.78 .07 | 43.0 1.2 | 58.66 +.05 | 57.6 2.1 | 44.44 .07 | 13.3 1.3 | 45.38 +.04 | 53.4 2.8 |
| 34.4 | 29.83 +.03 | 44.2 — 1.1 | 58.69 .00 | 59.7 — 1.9 | 44.49 +.03 | 14.6 — 1.2 | 45.39 —.01 | 56.2 — 2.6 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Orionis. | | γ Orionis. | | δ Camelop. (H.) | | μ Geminorum. | |
|------------------------|--------------------------------------|-----------------------|-------------------------------------|-----------------------|-------------------------------------|-----------------------|--------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 5 ^m 49 | + 7° 23' | ^h 6 ^m 1 | + 14° 46' | ^h 6 ^m 6 | + 69° 21' | ^h 6 ^m 16 | + 22° 34' |
| (Dec.30.5) | ^s 16.54 +.07 | 11.2 -0.8 | ^s 21.27 +.08 | 52.7 -0.4 | ^s 51.55 +.14 | 29.1 +2.7 | ^s 22.32 +.10 | 9.8 0.0 |
| Jan. 9.5 | 16.59 +.02 | 10.4 0.7 | 21.33 +.04 | 52.4 0.3 | 51.64 +.02 | 31.8 2.6 | 22.40 .06 | 9.9 +0.1 |
| 19.4 | 16.59 -.02 | 9.8 0.6 | 21.35 -.01 | 52.1 0.2 | 51.60 -.12 | 34.4 2.5 | 22.44 +.01 | 10.0 0.2 |
| 29.4 | 16.54 .06 | 9.2 0.5 | 21.32 .05 | 51.9 0.2 | 51.44 .22 | 36.8 2.3 | 22.42 -.04 | 10.3 0.2 |
| Feb. 8.4 | 16.46 .10 | 8.8 0.4 | 21.24 .09 | 51.8 -0.1 | 51.16 .32 | 39.0 2.0 | 22.35 .09 | 10.5 0.3 |
| 18.4 | 16.34 -.13 | 8.5 -0.3 | 21.12 -.13 | 51.7 0.0 | 50.78 -.41 | 40.8 +1.6 | 22.24 -.13 | 10.8 +0.3 |
| 28.3 | 16.19 .15 | 8.3 -0.1 | 20.98 .15 | 51.7 0.0 | 50.34 .48 | 42.2 1.1 | 22.10 .15 | 11.0 0.2 |
| Mar. 10.3 | 16.02 .16 | 8.2 0.0 | 20.82 .17 | 51.8 +0.1 | 49.83 .52 | 43.1 0.7 | 21.93 .17 | 11.3 0.2 |
| 20.3 | 15.85 .17 | 8.2 +0.1 | 20.64 .17 | 51.8 0.1 | 49.30 .53 | 43.5 +0.2 | 21.75 .18 | 11.4 0.1 |
| 30.3 | 15.68 .16 | 8.4 0.2 | 20.47 .16 | 51.9 0.1 | 48.77 .52 | 43.4 -0.3 | 21.57 .18 | 11.6 +0.1 |
| Apr. 9.2 | 15.53 -.14 | 8.6 +0.3 | 20.31 -.15 | 52.1 +0.1 | 48.26 -.48 | 42.8 -0.8 | 21.40 -.16 | 11.6 0.0 |
| 19.2 | 15.39 .12 | 9.0 0.4 | 20.17 .13 | 52.2 0.2 | 47.81 .42 | 41.8 1.2 | 21.25 .14 | 11.6 0.0 |
| 29.2 | 15.29 .09 | 9.4 0.5 | 20.06 .10 | 52.4 0.2 | 47.42 .34 | 40.4 1.6 | 21.13 .11 | 11.6 0.0 |
| May 9.2 | 15.22 .05 | 10.0 0.6 | 19.98 .06 | 52.7 0.3 | 47.13 .24 | 38.6 1.9 | 21.04 .07 | 11.6 0.0 |
| 19.1 | 15.19 -.01 | 10.6 0.7 | 19.95 -.01 | 53.0 0.3 | 46.94 .14 | 36.5 2.1 | 20.99 -.02 | 11.5 0.0 |
| 29.1 | 15.20 +.03 | 11.4 +0.8 | 19.95 +.03 | 53.4 +0.4 | 46.85 -.03 | 34.3 -2.3 | 20.99 +.02 | 11.5 0.0 |
| June 8.1 | 15.26 .07 | 12.3 0.9 | 20.00 .07 | 53.8 0.5 | 46.87 +.08 | 32.0 2.4 | 21.03 .06 | 11.5 0.0 |
| 18.0 | 15.36 .11 | 13.3 1.0 | 20.10 .11 | 54.4 0.5 | 47.01 .19 | 29.6 2.4 | 21.11 .10 | 11.5 +0.1 |
| 28.0 | 15.50 .15 | 14.4 1.1 | 20.23 .15 | 55.0 0.6 | 47.26 .30 | 27.2 2.3 | 21.24 .14 | 11.6 0.1 |
| July 8.0 | 15.67 .19 | 15.5 1.1 | 20.40 .18 | 55.6 0.6 | 47.61 .39 | 24.9 2.2 | 21.40 .18 | 11.7 0.1 |
| 18.0 | 15.87 +.22 | 16.6 +1.1 | 20.60 +.21 | 56.3 +0.7 | 48.05 +.48 | 22.8 -2.0 | 21.60 +.21 | 11.9 +0.2 |
| 27.9 | 16.10 .24 | 17.7 1.0 | 20.82 .24 | 56.9 0.6 | 48.57 .56 | 20.8 1.8 | 21.82 .24 | 12.1 0.2 |
| Aug. 6.9 | 16.35 .26 | 18.7 0.9 | 21.08 .26 | 57.6 0.6 | 49.17 .63 | 19.1 1.6 | 22.08 .26 | 12.3 0.2 |
| 16.9 | 16.62 .27 | 19.6 0.8 | 21.35 .28 | 58.1 0.5 | 49.83 .69 | 17.7 1.3 | 22.36 .28 | 12.4 0.2 |
| 26.8 | 16.90 .28 | 20.4 0.7 | 21.63 .29 | 58.6 0.4 | 50.54 .73 | 16.6 1.0 | 22.65 .30 | 12.6 0.1 |
| Sept. 5.8 | 17.19 +.29 | 21.0 +0.5 | 21.93 +.30 | 59.0 +0.3 | 51.20 +.76 | 15.7 -0.6 | 22.96 +.31 | 12.7 +0.1 |
| 15.8 | 17.49 .30 | 21.3 +0.3 | 22.24 .31 | 59.3 +0.2 | 52.07 .78 | 15.3 -0.3 | 23.27 .32 | 12.7 0.0 |
| 25.8 | 17.79 .30 | 21.5 0.0 | 22.55 .31 | 59.4 0.0 | 52.86 .79 | 15.2 +0.1 | 23.60 .33 | 12.6 -0.1 |
| Oct. 5.7 | 18.09 .30 | 21.4 -0.2 | 22.86 .31 | 59.3 -0.1 | 53.65 .79 | 15.4 0.5 | 23.92 .33 | 12.5 0.1 |
| 15.7 | 18.38 .29 | 21.1 0.4 | 23.16 .30 | 59.1 0.3 | 54.44 .77 | 16.1 0.8 | 24.25 .32 | 12.4 0.2 |
| 25.7 | 18.67 +.28 | 20.6 -0.6 | 23.46 +.29 | 58.7 -0.4 | 55.20 +.74 | 17.1 +1.1 | 24.57 +.31 | 12.1 -0.3 |
| Nov. 4.7 | 18.94 .26 | 19.9 0.7 | 23.75 .28 | 58.3 0.5 | 55.92 .70 | 18.4 1.5 | 24.88 .30 | 11.8 0.3 |
| 14.6 | 19.19 .24 | 19.1 0.8 | 24.02 .26 | 57.8 0.6 | 56.59 .63 | 20.1 1.8 | 25.18 .28 | 11.6 0.3 |
| 24.6 | 19.42 .21 | 18.2 0.9 | 24.27 .23 | 57.2 0.6 | 57.19 .55 | 22.0 2.1 | 25.45 .26 | 11.3 0.2 |
| Dec. 4.6 | 19.62 .18 | 17.3 0.9 | 24.49 .20 | 56.6 0.6 | 57.70 .46 | 24.3 2.4 | 25.69 .23 | 11.1 0.2 |
| 14.5 | 19.78 +.14 | 16.3 -0.9 | 24.67 +.16 | 56.0 -0.5 | 58.11 +.35 | 26.8 +2.5 | 25.90 +.19 | 10.9 -0.1 |
| 24.5 | 19.90 .10 | 15.4 0.9 | 24.81 .12 | 55.5 0.5 | 58.41 .23 | 29.4 2.6 | 26.07 .14 | 10.8 0.0 |
| 34.5 | 19.98 +.05 | 14.6 -0.8 | 24.91 +.07 | 55.1 -0.4 | 58.58 +.11 | 32.1 +2.7 | 26.19 +.09 | 10.9 +0.1 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Argûs. (Canopus.) | | γ Geminorum. | | α Canis Majoris. (Sirius.) | | ϵ Canis Majoris. | |
|------------------------|-----------------------------------|-----------------------|-----------------------------------|-----------------------|--------------------------------------|-----------------------|-----------------------------------|-----------------------|
| | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination South. |
| | ^h ^m 6 21 | —52° 37' | ^h ^m 6 31 | +16° 29' | ^h ^m 6 40 | —16° 33' | ^h ^m 6 54 | —28° 49' |
| (Dec.30.5) | ^s 33.81 .00 | 69.5 —3.4 | ^s 25.23 +.11 | 32.0 —0.4 | ^s 21.39 +.10 | 59.4 —2.3 | ^s 21.32 +.09 | 24.0 —2.9 |
| Jan. 9.5 | 33.79 —.05 | 72.9 3.2 | 25.32 .07 | 31.7 0.3 | 21.46 +.05 | 61.7 2.2 | 21.40 +.05 | 26.8 2.7 |
| 19.4 | 33.70 .12 | 76.0 3.0 | 25.37 +.02 | 31.4 0.2 | 21.48 .00 | 63.8 2.0 | 21.42 .00 | 29.5 2.5 |
| 29.4 | 33.54 .19 | 78.8 2.7 | 25.36 —.03 | 31.3 —0.1 | 21.46 —.05 | 65.7 1.7 | 21.39 —.06 | 31.9 2.3 |
| Feb. 8.4 | 33.32 .24 | 81.3 2.2 | 25.31 .07 | 31.3 0.0 | 21.39 .09 | 67.3 1.5 | 21.30 .10 | 34.1 2.0 |
| 18.4 | 33.05 —.29 | 83.2 —1.7 | 25.21 —.11 | 31.3 +0.1 | 21.28 —.13 | 68.6 —1.2 | 21.18 —.14 | 35.9 —1.6 |
| 28.3 | 32.74 .33 | 84.8 1.2 | 25.08 .14 | 31.4 0.1 | 21.14 .16 | 69.6 0.9 | 21.02 .18 | 37.3 1.2 |
| Mar. 10.3 | 32.40 .35 | 85.8 0.7 | 24.93 .16 | 31.6 0.1 | 20.97 .18 | 70.3 0.5 | 20.82 .20 | 38.3 0.8 |
| 20.3 | 32.04 .36 | 86.2 —0.2 | 24.76 .17 | 31.7 0.2 | 20.78 .19 | 70.6 —0.2 | 20.62 .22 | 38.9 —0.4 |
| 30.3 | 31.68 .35 | 86.2 +0.3 | 24.58 .17 | 31.9 0.2 | 20.59 .19 | 70.6 +0.1 | 20.40 .22 | 39.1 0.0 |
| Apr. 9.2 | 31.33 —.34 | 85.6 +0.8 | 24.42 —.16 | 32.1 +0.2 | 20.40 —.18 | 70.4 +0.4 | 20.18 —.21 | 38.9 +0.4 |
| 19.2 | 31.01 .31 | 84.6 1.3 | 24.26 .14 | 32.2 0.2 | 20.23 .16 | 69.8 0.7 | 19.98 .19 | 38.3 0.8 |
| 29.2 | 30.71 .27 | 83.0 1.8 | 24.14 .11 | 32.4 0.2 | 20.08 .14 | 68.8 1.0 | 19.80 .17 | 37.3 1.2 |
| May 9.2 | 30.46 .23 | 81.0 2.2 | 24.04 .07 | 32.6 0.2 | 19.96 .11 | 67.7 1.3 | 19.64 .14 | 36.0 1.5 |
| 19.1 | 30.25 .18 | 78.7 2.5 | 23.99 —.03 | 32.9 0.3 | 19.87 .07 | 66.2 1.5 | 19.52 .10 | 34.3 1.8 |
| 29.1 | 30.10 —.12 | 76.0 +2.8 | 23.97 .00 | 33.2 +0.3 | 19.82 —.03 | 64.6 +1.7 | 19.43 —.06 | 32.4 +2.1 |
| June 8.1 | 30.00 —.06 | 73.0 3.1 | 23.99 +.04 | 33.5 0.3 | 19.81 +.01 | 62.7 1.9 | 19.39 —.02 | 30.1 2.3 |
| 18.0 | 29.97 .00 | 69.8 3.2 | 24.06 .08 | 33.8 0.4 | 19.84 .05 | 60.7 2.0 | 19.39 +.02 | 27.7 2.5 |
| 28.0 | 30.00 +.06 | 66.5 3.3 | 24.16 .12 | 34.2 0.4 | 19.91 .09 | 58.6 2.1 | 19.42 .06 | 25.1 2.6 |
| July 8.0 | 30.09 .12 | 63.2 3.3 | 24.31 .16 | 34.7 0.4 | 20.01 .12 | 56.4 2.1 | 19.50 .10 | 22.5 2.6 |
| 18.0 | 30.23 +.17 | 59.9 +3.2 | 24.48 +.19 | 35.1 +0.4 | 20.15 +.15 | 54.3 +2.1 | 19.62 +.13 | 19.9 +2.6 |
| 27.9 | 30.44 .23 | 56.8 3.0 | 24.69 .22 | 35.5 0.4 | 20.32 .18 | 52.3 2.0 | 19.78 .17 | 17.3 2.5 |
| Aug. 6.9 | 30.69 .27 | 53.9 2.7 | 24.92 .24 | 35.9 0.4 | 20.52 .21 | 50.4 1.8 | 19.96 .20 | 15.0 2.3 |
| 16.9 | 30.98 .22 | 51.4 2.3 | 25.18 .26 | 36.3 0.3 | 20.74 .23 | 48.7 1.5 | 20.18 .23 | 12.8 2.0 |
| 26.8 | 31.32 .25 | 49.2 1.8 | 25.45 .28 | 36.6 0.2 | 20.99 .25 | 47.3 1.2 | 20.43 .26 | 11.0 1.6 |
| Sept. 5.8 | 31.69 +.28 | 47.6 +1.3 | 25.74 +.29 | 36.7 +0.1 | 21.26 +.27 | 46.3 +0.8 | 20.69 +.28 | 9.6 +1.2 |
| 15.8 | 32.08 .40 | 46.6 0.7 | 26.04 .30 | 36.8 0.0 | 21.54 .28 | 45.6 +0.4 | 20.98 .29 | 8.6 0.7 |
| 25.8 | 32.48 .41 | 46.2 +0.1 | 26.35 .31 | 36.6 —0.2 | 21.83 .29 | 45.4 0.0 | 21.28 .31 | 8.2 +0.2 |
| Oct. 5.7 | 32.90 .41 | 46.4 —0.6 | 26.66 .32 | 36.4 0.3 | 22.12 .30 | 45.6 —0.5 | 21.60 .32 | 8.2 —0.3 |
| 15.7 | 33.30 .40 | 47.3 1.2 | 26.98 .33 | 36.0 0.4 | 22.42 .30 | 46.2 0.9 | 21.91 .32 | 8.8 0.8 |
| 25.7 | 33.70 +.28 | 48.8 —1.8 | 27.29 +.31 | 35.6 —0.5 | 22.72 +.29 | 47.3 —1.3 | 22.23 +.31 | 10.0 —1.3 |
| Nov. 4.7 | 34.06 .35 | 50.9 2.3 | 27.60 .30 | 35.0 0.6 | 23.01 .28 | 48.8 1.7 | 22.54 .30 | 11.6 1.8 |
| 14.6 | 34.39 .31 | 53.4 2.8 | 27.89 .28 | 34.4 0.6 | 23.28 .26 | 50.6 2.0 | 22.83 .28 | 13.6 2.2 |
| 24.6 | 34.67 .26 | 56.4 3.1 | 28.16 .28 | 33.7 0.6 | 23.54 .24 | 52.7 2.2 | 23.10 .25 | 16.0 2.5 |
| Dec. 4.6 | 34.90 .20 | 59.7 3.3 | 28.41 .23 | 33.1 0.6 | 23.76 .21 | 55.0 2.3 | 23.34 .22 | 18.7 2.8 |
| 14.5 | 35.06 +.13 | 63.1 —3.5 | 28.62 +.19 | 32.5 —0.5 | 23.96 +.17 | 57.4 —2.4 | 23.55 +.18 | 21.6 —2.9 |
| 24.5 | 35.16 +.06 | 66.6 3.5 | 28.80 .15 | 32.0 0.4 | 24.11 .13 | 59.8 2.4 | 23.71 .13 | 24.5 2.9 |
| 34.5 | 35.19 —.01 | 70.1 —3.4 | 28.93 +.10 | 31.6 —0.3 | 24.22 +.08 | 62.1 —2.3 | 23.82 +.08 | 27.4 —2.8 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | δ Canis Majoris. | | δ Geminorum. | | Piazzi vii. 67. | | α^2 Geminorum. (Castor.) | |
|------------------------|-------------------------------------|--|--------------------------------------|--|--------------------------------------|--|--------------------------------------|---------------------------------------|
| | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 7 ^m 3 | [°] -26 ['] 12 | ^h 7 ^m 13 | [°] +22 ['] 10 | ^h 7 ^m 19 | [°] +68 ['] 41 | ^h 7 ^m 27 | [°] +32 ['] 7 |
| (Dec.30.5) | ^s 58.26 +.11 | ["] 69.8 -2.8 | ^s 37.13 +.16 | ["] 58.3 -0.2 | ^s 34.08 +.34 | ["] 14.6 +2.4 | ^s 39.14 +.19 | ["] 38.4 +0.3 |
| Jan. 9.5 | 58.35 .06 | 72.6 2.7 | 37.27 .11 | 58.2 0.0 | 34.36 .22 | 17.1 2.5 | 39.31 .14 | 38.9 0.5 |
| 19.5 | 58.38 +.01 | 75.2 2.5 | 37.36 .06 | 58.2 +0.1 | 34.52 +.09 | 19.7 2.6 | 39.43 .08 | 39.5 0.7 |
| 29.5 | 58.37 -.04 | 77.6 2.2 | 37.40 +.01 | 58.4 0.2 | 34.55 -.04 | 22.4 2.6 | 39.48 +.03 | 40.3 0.8 |
| Feb. 8.4 | 58.30 .09 | 79.7 1.9 | 37.38 -.04 | 58.6 0.3 | 34.45 .16 | 24.9 2.4 | 39.48 -.03 | 41.1 0.0 |
| 18.4 | 58.19 -.13 | 81.4 -1.6 | 37.32 -.08 | 59.0 +0.4 | 34.24 -.27 | 27.2 +2.2 | 39.42 -.08 | 42.0 +0.9 |
| 28.4 | 58.04 .16 | 82.9 1.2 | 37.21 .19 | 59.4 0.4 | 33.92 .36 | 29.3 1.9 | 39.32 .19 | 42.8 0.8 |
| Mar. 10.3 | 57.86 .19 | 83.9 0.8 | 37.08 .15 | 59.8 0.4 | 33.52 .43 | 31.0 1.5 | 39.17 .16 | 43.6 0.7 |
| 20.3 | 57.66 .20 | 84.6 0.5 | 36.91 .17 | 60.2 0.4 | 33.07 .48 | 32.3 1.0 | 39.00 .18 | 44.3 0.6 |
| 30.3 | 57.45 .21 | 84.8 -0.1 | 36.74 .17 | 60.6 0.3 | 32.57 .50 | 33.1 0.6 | 38.81 .19 | 44.9 0.5 |
| Apr. 9.3 | 57.25 -.20 | 84.7 +0.3 | 36.57 -.17 | 60.8 +0.3 | 32.07 -.49 | 33.4 +0.1 | 38.62 -.19 | 45.2 +0.3 |
| 19.2 | 57.05 .19 | 84.2 0.7 | 36.40 .15 | 61.1 0.2 | 31.58 .47 | 33.3 -0.4 | 38.44 .17 | 45.5 +0.1 |
| 29.2 | 56.87 .17 | 83.3 1.1 | 36.26 .13 | 61.2 0.1 | 31.12 .49 | 32.6 0.9 | 38.28 .15 | 45.5 0.0 |
| May 9.2 | 56.72 .14 | 82.1 1.4 | 36.14 .10 | 61.4 +0.1 | 30.74 .35 | 31.5 1.3 | 38.14 .19 | 45.4 -0.2 |
| 19.1 | 56.60 .10 | 80.5 1.7 | 36.05 .07 | 61.4 0.0 | 30.42 .27 | 30.0 1.6 | 38.03 .08 | 45.2 0.3 |
| 29.1 | 56.51 -.06 | 78.7 +2.0 | 36.00 -.03 | 61.4 0.0 | 30.19 -.19 | 28.2 -1.9 | 37.96 -.04 | 44.8 -0.4 |
| June 8.1 | 56.46 -.02 | 76.6 2.2 | 35.99 +.01 | 61.4 0.0 | 30.05 -.09 | 26.2 2.2 | 37.94 .00 | 44.4 0.5 |
| 18.1 | 56.46 +.02 | 74.3 2.4 | 36.02 .05 | 61.4 0.0 | 30.01 +.01 | 23.9 2.4 | 37.95 +.04 | 43.8 0.6 |
| 28.0 | 56.49 .05 | 71.9 2.5 | 36.09 .09 | 61.4 0.0 | 30.07 .11 | 21.4 2.5 | 38.01 .08 | 43.2 0.6 |
| July 8.0 | 56.56 .09 | 69.4 2.5 | 36.20 .12 | 61.4 0.0 | 30.23 .21 | 18.9 2.5 | 38.11 .12 | 42.6 0.7 |
| 18.0 | 56.67 +.13 | 66.9 +2.5 | 36.34 +.16 | 61.3 -0.1 | 30.48 +.30 | 16.4 -2.5 | 38.25 +.10 | 41.9 -0.7 |
| 28.0 | 56.82 .16 | 64.4 2.4 | 36.51 .19 | 61.2 0.1 | 30.83 .39 | 13.9 2.4 | 38.43 .19 | 41.2 0.7 |
| Aug. 6.9 | 57.00 .19 | 62.2 2.2 | 36.72 .22 | 61.1 0.1 | 31.26 .47 | 11.5 2.3 | 38.64 .22 | 40.4 0.7 |
| 16.9 | 57.20 .22 | 60.1 1.9 | 36.95 .24 | 61.0 0.2 | 31.77 .54 | 9.3 2.1 | 38.87 .25 | 39.7 0.8 |
| 26.9 | 57.44 .25 | 58.3 1.6 | 37.20 .26 | 60.7 0.2 | 32.34 .60 | 7.2 1.9 | 39.14 .28 | 38.9 0.8 |
| Sept. 5.9 | 57.70 +.27 | 57.0 +1.2 | 37.48 +.28 | 60.4 -0.3 | 32.98 +.66 | 5.4 -1.7 | 39.43 +.30 | 38.2 -0.8 |
| 15.8 | 57.98 .29 | 56.0 0.7 | 37.77 .30 | 60.1 0.4 | 33.66 .71 | 3.9 1.4 | 39.74 .32 | 37.4 0.8 |
| 25.8 | 58.27 .30 | 55.5 +0.2 | 38.08 .31 | 59.6 0.5 | 34.39 .74 | 2.7 1.1 | 40.07 .34 | 36.6 0.8 |
| Oct. 5.8 | 58.58 .31 | 55.6 -0.3 | 38.40 .32 | 59.1 0.6 | 35.15 .77 | 1.8 0.7 | 40.41 .35 | 35.8 0.8 |
| 15.7 | 58.89 .31 | 56.1 0.8 | 38.73 .33 | 58.4 0.6 | 35.92 .78 | 1.2 -0.3 | 40.77 .36 | 35.1 0.7 |
| 25.7 | 59.21 +.31 | 57.2 -1.3 | 39.07 +.33 | 57.8 -0.7 | 36.71 +.78 | 1.1 0.0 | 41.14 +.37 | 34.4 -0.7 |
| Nov. 4.7 | 59.52 .30 | 58.7 1.8 | 39.40 .33 | 57.1 0.7 | 37.48 .76 | 1.3 +0.4 | 41.50 .36 | 33.8 0.6 |
| 14.7 | 59.81 .28 | 60.7 2.2 | 39.73 .32 | 56.4 0.7 | 38.23 .73 | 2.0 0.8 | 41.86 .35 | 33.2 0.5 |
| 24.6 | 60.09 .26 | 63.0 2.5 | 40.04 .30 | 55.7 0.6 | 38.94 .68 | 3.0 1.2 | 42.21 .34 | 32.8 0.3 |
| Dec. 4.6 | 60.34 .23 | 65.6 2.7 | 40.33 .27 | 55.1 0.5 | 39.58 .61 | 4.5 1.6 | 42.54 .31 | 32.6 -0.1 |
| 14.6 | 60.55 +.19 | 68.4 -2.8 | 40.59 +.24 | 54.6 -0.4 | 40.16 +.52 | 6.3 +2.0 | 42.83 +.28 | 32.6 0.0 |
| 24.6 | 60.72 .15 | 71.2 2.8 | 40.81 .20 | 54.3 0.3 | 40.63 .42 | 8.5 2.3 | 43.09 .23 | 32.7 +0.2 |
| 34.5 | 60.84 +.10 | 74.0 -2.7 | 40.99 +.15 | 54.1 -0.1 | 40.99 +.30 | 10.8 +2.5 | 43.29 +.17 | 33.1 +0.4 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Canis Minoris. (Procyon.) | | β Geminorum. (Pollux.) | | ϕ Geminorum. | | 3 Ursæ Majoris (H.) | |
|------------------------|---------------------------------------|--|--------------------------------------|---------------------------|--------------------------------------|--------------------------|-------------------------------------|---------------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 7 ^m 33 | + [°] 5 ['] 30 | ^h 7 ^m 38 | +28° 17' | ^h 7 ^m 46 | +27° 2' | ^h 8 ^m 1 | +68° 47' |
| (Dec 30.5) | ^s 36.13 +.16 | ["] 17.2 -1.3 | ^s 39.11 +.20 | ["] 20.9 +0.1 | ^s 49.92 +.20 | ["] 51.5 0.0 | ^s 59.64 +.44 | ["] 36.0 +2.2 |
| Jan. 9.5 | 36.27 .12 | 15.9 1.1 | 39.28 .15 | 21.1 0.3 | 50.10 .16 | 51.6 +0.2 | 60.03 .33 | 38.3 2.4 |
| 19.5 | 36.37 .07 | 14.8 1.0 | 39.40 .09 | 21.4 0.4 | 50.23 .10 | 51.9 0.3 | 60.30 .20 | 40.8 2.6 |
| 29.5 | 36.42 +.02 | 14.0 0.8 | 39.47 +.04 | 21.9 0.5 | 50.30 +.04 | 52.3 0.5 | 60.44 +.07 | 43.5 2.6 |
| Feb. 8.4 | 36.41 -.03 | 13.2 0.6 | 39.48 -.02 | 22.5 0.6 | 50.32 -.01 | 52.9 0.6 | 60.45 -.05 | 46.1 2.6 |
| 18.4 | 36.36 -.07 | 12.7 -0.4 | 39.43 -.07 | 23.2 +0.7 | 50.29 -.06 | 53.5 +0.7 | 60.34 -.17 | 48.7 +2.5 |
| 28.4 | 36.27 .11 | 12.4 0.3 | 39.34 .11 | 24.0 0.7 | 50.20 .10 | 54.2 0.7 | 60.11 .28 | 51.1 2.2 |
| Mar 10.3 | 36.15 .13 | 12.2 -0.1 | 39.21 .14 | 24.7 0.7 | 50.08 .14 | 54.9 0.7 | 59.78 .36 | 53.2 1.9 |
| 20.3 | 36.00 .15 | 12.1 0.0 | 39.05 .17 | 25.3 0.6 | 49.93 .16 | 55.5 0.6 | 59.38 .43 | 54.9 1.5 |
| 30.3 | 35.84 .16 | 12.2 +0.1 | 38.87 .18 | 25.9 0.5 | 49.76 .17 | 56.1 0.5 | 58.92 .47 | 56.2 1.0 |
| Apr. 9.3 | 35.68 -.16 | 12.4 +0.2 | 38.69 -.18 | 26.3 +0.4 | 49.59 -.17 | 56.6 +0.4 | 58.43 -.49 | 57.0 +0.6 |
| 19.2 | 35.52 .15 | 12.7 0.3 | 38.52 .17 | 26.6 0.2 | 49.41 .16 | 56.9 0.3 | 57.94 .48 | 57.4 +0.1 |
| 29.2 | 35.38 .13 | 13.1 0.4 | 38.36 .15 | 26.8 +0.1 | 49.25 .15 | 57.2 0.2 | 57.47 .45 | 57.3 -0.4 |
| May 9.2 | 35.25 .11 | 13.6 0.5 | 38.22 .12 | 26.8 0.0 | 49.12 .12 | 57.3 +0.1 | 57.03 .41 | 56.6 0.9 |
| 19.2 | 35.16 .08 | 14.2 0.6 | 38.11 .09 | 26.8 -0.1 | 49.01 .09 | 57.3 0.0 | 56.65 .35 | 55.6 1.3 |
| 29.1 | 35.10 -.05 | 14.8 +0.7 | 38.04 -.05 | 26.6 -0.2 | 48.93 -.06 | 57.2 -0.1 | 56.34 -.27 | 54.1 -1.6 |
| June 8.1 | 35.07 -.01 | 15.6 0.8 | 38.00 -.01 | 26.3 0.3 | 48.89 -.02 | 57.0 0.2 | 56.11 .18 | 52.2 1.9 |
| 18.1 | 35.07 +.02 | 16.4 0.8 | 38.01 +.03 | 26.0 0.4 | 48.89 +.02 | 56.7 0.3 | 55.97 -.09 | 50.1 2.2 |
| 28.0 | 35.11 .06 | 17.2 0.8 | 38.05 .07 | 25.6 0.4 | 48.93 .06 | 56.4 0.4 | 55.93 .00 | 47.7 2.4 |
| July 8.0 | 35.12 .09 | 18.0 0.8 | 38.14 .10 | 25.1 0.5 | 49.01 .09 | 56.0 0.4 | 55.98 +.10 | 45.2 2.6 |
| 18.0 | 35.29 +.12 | 18.8 +0.8 | 38.26 +.14 | 24.6 -0.5 | 49.12 +.13 | 55.5 -0.5 | 56.13 +.19 | 42.6 -2.7 |
| 28.0 | 35.43 .15 | 19.6 0.7 | 38.42 .17 | 24.1 0.6 | 49.27 .16 | 55.0 0.5 | 56.36 .28 | 39.9 2.7 |
| Aug. 6.9 | 35.60 .18 | 20.3 0.6 | 38.61 .20 | 23.5 0.6 | 49.45 .19 | 54.5 0.6 | 56.69 .37 | 37.2 2.6 |
| 16.9 | 35.79 .20 | 20.9 0.5 | 38.83 .23 | 22.9 0.6 | 49.66 .22 | 53.9 0.6 | 57.10 .45 | 34.6 2.5 |
| 26.9 | 36.00 .23 | 21.3 0.3 | 39.07 .26 | 22.2 0.7 | 49.90 .25 | 53.2 0.7 | 57.59 .52 | 32.2 2.4 |
| Sept. 4.9 | 36.24 +.25 | 21.6 +0.1 | 39.34 +.28 | 21.5 -0.7 | 50.16 +.27 | 52.5 -0.7 | 58.14 +.59 | 29.8 -2.2 |
| 15.8 | 36.50 .27 | 21.6 -0.1 | 39.63 .30 | 20.8 0.8 | 50.44 .29 | 51.8 0.8 | 58.76 .65 | 27.7 2.0 |
| 25.8 | 36.78 .28 | 21.4 0.3 | 39.94 .32 | 20.0 0.8 | 50.75 .31 | 50.9 0.8 | 59.43 .69 | 25.9 1.7 |
| Oct. 5.8 | 37.06 .29 | 20.9 0.6 | 40.27 .34 | 19.2 0.8 | 51.07 .33 | 50.1 0.9 | 60.15 .73 | 24.4 1.4 |
| 15.7 | 37.37 .30 | 20.2 0.8 | 40.62 .35 | 18.4 0.8 | 51.41 .34 | 49.2 0.9 | 60.91 .76 | 23.2 1.0 |
| 25.7 | 37.68 +.31 | 19.2 -1.0 | 40.97 +.35 | 17.5 -0.8 | 51.76 +.35 | 48.3 -0.9 | 61.69 +.78 | 22.3 -0.6 |
| Nov. 4.7 | 37.99 .31 | 18.1 1.2 | 41.32 .35 | 16.7 0.8 | 52.11 .35 | 47.4 0.9 | 62.47 .78 | 21.9 -0.2 |
| 14.7 | 38.29 .30 | 16.8 1.4 | 41.67 .34 | 16.0 0.7 | 52.46 .34 | 46.6 0.8 | 63.26 .77 | 21.9 +0.2 |
| 24.6 | 38.59 .29 | 15.4 1.5 | 42.01 .33 | 15.4 0.6 | 52.80 .33 | 45.8 0.7 | 64.01 .73 | 22.4 0.7 |
| Dec. 4.6 | 38.87 .27 | 13.9 1.5 | 42.34 .31 | 14.9 0.4 | 53.13 .31 | 45.2 0.5 | 64.72 .68 | 23.3 1.1 |
| 14.6 | 39.12 +.24 | 12.4 -1.5 | 42.63 +.27 | 14.6 -0.2 | 53.43 +.28 | 44.8 -0.3 | 65.38 +.61 | 24.6 +1.5 |
| 24.6 | 39.34 .20 | 11.0 1.4 | 42.88 .23 | 14.5 0.0 | 53.69 .24 | 44.5 -0.1 | 65.94 .52 | 26.4 1.9 |
| 34.5 | 39.52 +.15 | 9.6 -1.3 | 43.10 +.19 | 14.5 +0.1 | 53.91 +.19 | 44.5 +0.1 | 66.41 +.41 | 28.5 +2.2 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | 15 Argus (ρ) | | η Cancri. | | ϵ Hydræ. | | ι Ursæ Majoris. | |
|------------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|-----------------------|-----------------------|
| | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 8 | ^m 2 | ^h 8 | ^m 26 | ^h 8 | ^m 40 | ^h 8 | ^m 51 |
| | | | | | | | | |
| (Dec. 30.6) | 54.65 +.17 | 18.5 -2.8 | 24.58 +.23 | 40.4 -0.5 | 60.41 +.23 | 69.1 -1.5 | 45.08 +.34 | 65.3 +0.8 |
| Jan. 9.5 | 54.81 .13 | 21.3 2.7 | 24.80 .19 | 39.9 0.4 | 60.62 .18 | 67.7 1.3 | 45.39 .28 | 66.3 1.1 |
| 19.5 | 54.91 .08 | 24.0 2.6 | 24.96 .14 | 39.6 -0.2 | 60.79 .14 | 66.5 1.1 | 45.64 .21 | 67.5 1.4 |
| 29.5 | 54.96 +.02 | 26.6 2.4 | 25.07 .08 | 39.6 0.0 | 60.90 .09 | 65.5 0.9 | 45.82 .14 | 69.0 1.6 |
| Feb. 8.5 | 54.95 -.03 | 28.9 2.2 | 25.13 +.03 | 39.7 +0.2 | 60.96 +.04 | 64.8 0.6 | 45.92 +.07 | 70.8 1.7 |
| 18.4 | 54.90 -.07 | 31.0 -1.9 | 25.14 -.02 | 40.0 +0.4 | 60.98 -.01 | 64.2 -0.4 | 45.96 .00 | 72.6 +1.8 |
| 28.4 | 54.80 .11 | 32.7 1.6 | 25.09 .06 | 40.4 0.5 | 60.94 .05 | 63.9 0.2 | 45.92 -.07 | 74.4 1.8 |
| Mar. 10.4 | 54.67 .15 | 34.1 1.2 | 25.00 .10 | 41.0 0.5 | 60.87 .09 | 63.7 -0.1 | 45.82 .13 | 76.2 1.7 |
| 20.4 | 54.51 .17 | 35.1 0.8 | 24.89 .13 | 41.5 0.6 | 60.77 .12 | 63.7 +0.1 | 45.66 .17 | 77.9 1.6 |
| 30.3 | 54.33 .18 | 35.8 0.5 | 24.74 .15 | 42.1 0.6 | 60.64 .14 | 63.9 0.2 | 45.47 .20 | 79.4 1.3 |
| Apr. 9.3 | 54.14 -.19 | 36.1 -0.1 | 24.59 -.16 | 42.6 +0.5 | 60.50 -.15 | 64.1 +0.3 | 45.25 -.22 | 80.6 +1.0 |
| 19.3 | 53.95 .18 | 36.1 +0.2 | 24.43 .15 | 43.2 0.5 | 60.35 .15 | 64.5 0.4 | 45.02 .23 | 81.5 0.7 |
| 29.3 | 53.77 .17 | 35.7 0.6 | 24.28 .14 | 43.6 0.4 | 60.20 .14 | 64.9 0.5 | 44.78 .23 | 82.0 +0.4 |
| May 9.2 | 53.61 .15 | 34.9 0.9 | 24.14 .13 | 43.9 0.3 | 60.07 .12 | 65.4 0.5 | 44.56 .21 | 82.2 0.0 |
| 19.2 | 53.47 .13 | 33.8 1.2 | 24.02 .11 | 44.2 0.2 | 59.95 .10 | 65.9 0.6 | 44.36 .19 | 82.1 -0.3 |
| 29.2 | 53.35 -.10 | 32.5 +1.5 | 23.93 -.08 | 44.4 +0.1 | 59.86 -.08 | 66.5 +0.6 | 44.19 -.15 | 81.7 -0.6 |
| June 8.1 | 53.27 .07 | 30.9 1.8 | 23.86 .05 | 44.6 0.0 | 59.79 .05 | 67.1 0.6 | 44.06 .11 | 80.9 0.9 |
| 18.1 | 53.22 -.03 | 29.0 2.0 | 23.83 -.01 | 44.6 0.0 | 59.75 -.02 | 67.8 0.6 | 43.97 .07 | 79.8 1.2 |
| 28.1 | 53.20 .00 | 27.0 2.1 | 23.84 +.02 | 44.6 -0.1 | 59.74 .00 | 68.4 0.6 | 43.92 -.03 | 78.5 1.4 |
| July 8.1 | 53.22 +.04 | 24.8 2.2 | 23.87 .05 | 44.5 0.1 | 59.76 +.03 | 69.0 0.6 | 43.92 +.02 | 77.0 1.6 |
| 18.0 | 53.27 +.07 | 22.6 +2.2 | 23.94 +.08 | 44.4 -0.2 | 59.80 +.06 | 69.6 +0.6 | 43.96 +.07 | 75.3 -1.8 |
| 28.0 | 53.36 .10 | 20.3 2.2 | 24.04 .11 | 44.1 0.3 | 59.88 .09 | 70.2 0.5 | 44.05 .11 | 73.4 1.9 |
| Aug. 7.0 | 53.48 .14 | 18.2 2.1 | 24.17 .14 | 43.8 0.4 | 59.98 .12 | 70.6 0.4 | 44.18 .15 | 71.4 2.0 |
| 17.0 | 53.63 .17 | 16.2 1.9 | 24.34 .17 | 43.3 0.5 | 60.12 .15 | 71.0 0.3 | 44.36 .20 | 69.4 2.1 |
| 26.9 | 53.82 .20 | 14.4 1.6 | 24.52 .20 | 42.8 0.6 | 60.28 .17 | 71.1 +0.1 | 44.58 .24 | 67.3 2.1 |
| Sept. 5.9 | 54.03 +.23 | 13.0 +1.3 | 24.74 +.23 | 42.1 -0.7 | 60.46 +.20 | 71.1 -0.1 | 44.84 +.28 | 65.2 -2.1 |
| 15.9 | 54.27 .25 | 11.9 0.9 | 24.98 .25 | 41.4 0.8 | 60.68 .23 | 70.9 0.3 | 45.14 .32 | 63.1 2.0 |
| 25.8 | 54.54 .27 | 11.2 +0.4 | 25.25 .28 | 40.4 0.9 | 60.92 .25 | 70.5 0.5 | 45.48 .35 | 61.1 1.9 |
| Oct. 5.8 | 54.82 .29 | 11.0 0.0 | 25.54 .30 | 39.4 1.0 | 61.18 .27 | 69.8 0.2 | 45.85 .39 | 59.2 1.8 |
| 15.8 | 55.13 .31 | 11.3 -0.5 | 25.85 .32 | 38.3 1.1 | 61.47 .29 | 68.9 1.0 | 46.25 .42 | 57.4 1.7 |
| 25.8 | 55.44 +.32 | 12.1 -1.0 | 26.18 +.33 | 37.1 -1.2 | 61.77 +.31 | 67.8 -1.2 | 46.68 +.44 | 55.8 -1.5 |
| Nov. 4.7 | 55.76 .32 | 13.4 1.5 | 26.52 .34 | 35.9 1.3 | 62.08 .32 | 66.4 1.4 | 47.13 .45 | 54.4 1.2 |
| 14.7 | 56.08 .31 | 15.1 1.9 | 26.86 .34 | 34.6 1.3 | 62.41 .32 | 64.9 1.6 | 47.60 .46 | 53.3 0.9 |
| 24.7 | 56.40 .30 | 17.2 2.3 | 27.20 .33 | 33.4 1.2 | 62.73 .32 | 63.3 1.6 | 48.06 .46 | 52.5 0.6 |
| Dec. 4.7 | 56.69 .28 | 19.7 2.5 | 27.53 .32 | 32.2 1.1 | 63.05 .31 | 61.6 1.7 | 48.52 .44 | 52.1 -0.3 |
| 14.6 | 56.95 +.25 | 22.3 -2.7 | 27.85 +.30 | 31.2 -0.9 | 63.35 +.29 | 60.0 -1.6 | 48.95 +.41 | 52.0 +0.1 |
| 24.6 | 57.18 .21 | 25.1 2.8 | 28.13 .27 | 30.4 0.7 | 63.62 .28 | 58.4 1.5 | 49.35 .37 | 52.3 0.5 |
| 34.6 | 57.37 +.16 | 28.0 -2.8 | 28.37 +.22 | 29.7 -0.5 | 63.86 +.22 | 56.9 -1.4 | 49.70 +.32 | 53.0 +0.9 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | σ^2 Ursæ Majoris. | | κ Cancri. | | ϵ Argûs. | | δ Draconis (H.) | |
|------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. |
| | ^h 9 | ^m 0 | ^h 9 | ^m 1 | ^h 9 | ^m 14 | ^h 9 | ^m 21 |
| | | +67° 34' | | +11° 6' | | -58° 48' | | +81° 48' |
| (Dec.30.6) | ^s 49.28 +.54 | ["] 29.9 +1.5 | ^s 50.74 +.35 | ["] 26.0 -1.3 | ^s 11.50 +.31 | ["] 46.9 -3.5 | ^s 35.82+1.38 | ["] 19.2 +1.9 |
| Jan. 9.6 | 49.78 .45 | 31.6 1.9 | 50.97 .21 | 24.8 1.1 | 11.78 .94 | 50.5 3.6 | 37.10 1.15 | 21.3 2.3 |
| 19.6 | 50.18 .34 | 33.8 2.3 | 51.16 .16 | 23.8 0.9 | 11.97 .15 | 54.2 3.7 | 38.12 .88 | 23.8 2.7 |
| 29.5 | 50.46 .22 | 36.2 2.5 | 51.30 .11 | 23.0 0.6 | 12.09 +.07 | 58.0 3.7 | 38.86 .59 | 26.6 2.9 |
| Feb. 8.5 | 50.62 +.10 | 38.8 2.6 | 51.39 .06 | 22.5 0.4 | 12.12 -.01 | 61.7 3.6 | 39.30+ .98 | 29.6 3.0 |
| 18.5 | 50.66 -.02 | 41.4 +2.6 | 51.42 +.01 | 22.2 -0.2 | 12.07 -.06 | 65.3 -3.5 | 39.42-. .03 | 32.7 +3.0 |
| 28.4 | 50.58 .13 | 44.0 2.5 | 51.41 -.03 | 22.0 0.0 | 11.94 .15 | 68.6 3.2 | 39.23 .33 | 35.7 2.9 |
| Mar.10.4 | 50.39 .23 | 46.5 2.3 | 51.36 .07 | 22.1 +0.1 | 11.75 .22 | 71.7 2.9 | 38.75 .61 | 38.6 2.7 |
| 20.4 | 50.11 .32 | 48.8 2.1 | 51.27 .10 | 22.3 0.2 | 11.49 .27 | 74.4 2.5 | 38.02 .84 | 41.2 2.4 |
| 30.4 | 49.76 .38 | 50.7 1.7 | 51.15 .12 | 22.6 0.3 | 11.20 .31 | 76.7 2.0 | 37.06 1.04 | 43.4 2.0 |
| Apr. 9.3 | 49.35 -.42 | 52.2 +1.3 | 51.02 -.14 | 23.0 +0.4 | 10.66 -.34 | 78.5 -1.6 | 35.94-1.18 | 45.2 +1.5 |
| 19.3 | 48.91 .44 | 53.2 0.8 | 50.88 .14 | 23.4 0.5 | 10.51 .36 | 79.9 1.1 | 34.70 1.27 | 46.4 1.0 |
| 29.3 | 48.46 .44 | 53.8 +0.3 | 50.74 .14 | 23.9 0.5 | 10.14 .37 | 80.8 0.6 | 33.40 1.31 | 47.2 +0.4 |
| May 9.3 | 48.02 .42 | 53.9 -0.2 | 50.61 .13 | 24.4 0.5 | 9.77 .36 | 81.1 -0.1 | 32.08 1.30 | 47.3 -0.2 |
| 19.2 | 47.61 .39 | 53.4 0.6 | 50.49 .11 | 24.9 0.5 | 9.41 .35 | 80.9 +0.4 | 30.81 1.23 | 46.8 0.7 |
| 29.2 | 47.25 -.34 | 52.6 -1.1 | 50.39 -.09 | 25.4 +0.5 | 9.07 -.33 | 80.2 +0.9 | 29.62-1.13 | 45.8 -1.2 |
| June 8.2 | 46.94 .27 | 51.3 1.5 | 50.31 .06 | 25.9 0.5 | 8.76 .30 | 79.0 1.4 | 28.55 .99 | 44.4 1.7 |
| 18.1 | 46.70 .20 | 49.6 1.0 | 50.26 .04 | 26.4 0.4 | 8.48 .26 | 77.4 1.8 | 27.64 .81 | 42.4 2.1 |
| 28.1 | 46.53 .12 | 47.5 2.2 | 50.23 -.01 | 26.8 0.4 | 8.24 .21 | 75.4 2.2 | 26.92 .62 | 40.0 2.5 |
| July 8.1 | 46.45 -.04 | 45.2 2.4 | 50.23 +.02 | 27.2 0.3 | 8.05 .16 | 73.0 2.5 | 26.40 .41 | 37.3 2.8 |
| 18.1 | 46.44 +.04 | 42.6 -2.6 | 50.26 +.04 | 27.5 +0.3 | 7.51 -.11 | 70.3 +2.8 | 26.10-. .19 | 34.3 -3.1 |
| 28.0 | 46.52 .12 | 39.9 2.8 | 50.32 .07 | 27.7 0.2 | 7.83 -.05 | 67.4 3.0 | 26.02+ .04 | 31.1 3.3 |
| Aug. 7.0 | 46.69 .20 | 37.0 2.9 | 50.41 .10 | 27.9 +0.1 | 7.81 +.02 | 64.3 3.0 | 26.17 .26 | 27.8 3.4 |
| 17.0 | 46.93 .28 | 34.1 2.9 | 50.53 .13 | 27.9 0.0 | 7.86 .08 | 61.3 3.0 | 26.55 .49 | 24.4 3.4 |
| 27.0 | 47.25 .36 | 31.2 2.9 | 50.67 .16 | 27.8 -0.2 | 7.98 .15 | 58.4 2.9 | 27.15 .71 | 21.0 3.3 |
| Sept. 5.9 | 47.65 +.43 | 28.4 -2.8 | 50.85 +.19 | 27.5 -0.4 | 8.16 +.22 | 55.6 +2.6 | 27.97+ .98 | 17.7 -3.2 |
| 15.9 | 48.12 .50 | 25.6 2.6 | 51.05 .21 | 27.0 0.6 | 8.41 .28 | 53.2 2.2 | 28.99 1.12 | 14.5 3.1 |
| 25.9 | 48.65 .56 | 23.1 2.4 | 51.28 .24 | 26.3 0.8 | 8.72 .34 | 51.1 1.8 | 30.20 1.30 | 11.5 2.8 |
| Oct. 5.8 | 49.25 .62 | 20.8 2.2 | 51.53 .26 | 25.4 1.0 | 9.10 .39 | 49.6 1.3 | 31.59 1.46 | 8.8 2.5 |
| 15.8 | 49.90 .67 | 18.7 1.9 | 51.81 .29 | 24.3 1.2 | 9.52 .44 | 48.6 +0.7 | 33.13 1.60 | 6.5 2.2 |
| 25.8 | 50.59 +.71 | 17.0 -1.5 | 52.11 +.31 | 23.1 -1.4 | 9.97 +.47 | 48.2 0.0 | 34.80+1.71 | 4.5 -1.7 |
| Nov. 4.8 | 51.31 .73 | 15.6 1.1 | 52.43 .32 | 21.6 1.5 | 10.46 .49 | 48.4 -0.6 | 36.56 1.79 | 3.0 1.2 |
| 14.7 | 52.06 .75 | 14.7 0.7 | 52.76 .33 | 20.1 1.6 | 10.96 .50 | 49.3 1.2 | 38.38 1.83 | 2.0 0.7 |
| 24.7 | 52.81 .74 | 14.2 -0.2 | 53.09 .33 | 18.4 1.6 | 11.45 .48 | 50.9 1.8 | 40.21 1.82 | 1.6 -0.2 |
| Dec. 4.7 | 53.54 .72 | 14.3 +0.3 | 53.42 .32 | 16.8 1.6 | 11.92 .46 | 53.0 2.4 | 42.02 1.77 | 1.7 +0.4 |
| 14.7 | 54.23 +.68 | 14.8 +0.8 | 53.74 +.30 | 15.2 -1.5 | 12.36 +.41 | 55.7 -2.9 | 43.75+1.66 | 2.4 +0.9 |
| 24.6 | 54.87 .60 | 15.9 1.2 | 54.03 .28 | 13.7 1.4 | 12.75 .35 | 58.8 3.3 | 45.34 1.50 | 3.6 1.5 |
| 34.6 | 55.43 +.52 | 17.3 +1.7 | 54.29 +.24 | 12.4 -1.2 | 13.08 +.29 | 62.2 -3.6 | 46.76+1.30 | 5.4 +2.0 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Hydæ. | | δ Ursæ Majoris. | | θ Ursæ Majoris. | | ϵ Leonis. | |
|------------------------|-----------------------------------|-----------------------|-----------------------------------|-----------------------|-----------------------------------|-----------------------|-----------------------------------|-----------------------|
| | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h ^m 9 22 | ° ' " 8 11 | ^h ^m 9 24 | ° ' " 70 18 | ^h ^m 9 25 | ° ' " 52 10 | ^h ^m 9 39 | ° ' " 24 16 |
| (Dec.30.6) | ^s 13.94 +.25 | " 4.4 -2.3 | ^s 51.70 +.65 | " 24.7 +1.4 | ^s 34.30 +.39 | " 19.7 +0.6 | ^s 39.85 +.30 | " 32.1 -0.8 |
| Jan. 9.6 | 14.18 .21 | 6.6 2.1 | 52.30 .55 | 26.4 1.9 | 34.67 .34 | 20.6 1.0 | 40.13 .26 | 31.4 0.5 |
| 19.6 | 14.37 .17 | 8.7 2.0 | 52.80 .43 | 28.4 2.9 | 34.98 .27 | 21.8 1.4 | 40.37 .21 | 31.0 -0.2 |
| 29.5 | 14.51 .19 | 10.6 1.9 | 53.17 .30 | 30.8 2.5 | 35.22 .20 | 23.3 1.7 | 40.56 .16 | 30.9 0.0 |
| Feb. 8.5 | 14.61 .07 | 12.4 1.7 | 53.41 .17 | 33.4 2.7 | 35.38 .12 | 25.1 1.9 | 40.70 .11 | 31.0 +0.3 |
| 18.5 | 14.65 +.02 | 14.0 -1.4 | 53.51 +.03 | 36.2 +2.8 | 35.46 +.04 | 27.1 +2.1 | 40.78 +.05 | 31.5 +0.5 |
| 28.4 | 14.65 -.02 | 15.2 1.1 | 53.48 -.10 | 39.0 2.7 | 35.46 -.03 | 29.2 2.1 | 40.81 .00 | 32.1 0.7 |
| Mar. 10.4 | 14.61 .06 | 16.3 0.9 | 53.31 .21 | 41.6 2.6 | 35.39 .10 | 31.3 2.0 | 40.79 -.04 | 32.9 0.8 |
| 20.4 | 14.53 .09 | 17.1 0.6 | 53.04 .39 | 44.1 2.3 | 35.26 .15 | 33.2 1.9 | 40.73 .08 | 33.5 0.9 |
| 30.4 | 14.42 .11 | 17.6 0.4 | 52.68 .40 | 46.3 2.0 | 35.08 .20 | 35.0 1.7 | 40.63 .11 | 34.7 0.9 |
| Apr. 9.3 | 14.30 -.13 | 17.8 -0.1 | 52.25 -.45 | 48.0 +1.5 | 34.87 -.23 | 36.6 +1.4 | 40.51 -.13 | 35.6 +0.9 |
| 19.3 | 14.16 .14 | 17.9 +0.1 | 51.76 .49 | 49.4 1.1 | 34.63 .25 | 37.8 1.1 | 40.38 .14 | 36.4 0.8 |
| 29.3 | 14.02 .14 | 17.7 0.3 | 51.25 .51 | 50.2 0.6 | 34.38 .25 | 38.7 0.7 | 40.23 .14 | 37.2 0.7 |
| May 9.3 | 13.88 .13 | 17.3 0.5 | 50.74 .50 | 50.6 +0.1 | 34.13 .24 | 39.2 +0.3 | 40.09 .14 | 37.9 0.6 |
| 19.2 | 13.76 .19 | 16.8 0.6 | 50.25 .47 | 50.4 -0.4 | 33.89 .22 | 39.3 -0.1 | 39.96 .13 | 38.4 0.4 |
| 29.2 | 13.64 -.10 | 16.0 +0.8 | 49.80 -.49 | 49.7 -0.9 | 33.68 -.20 | 39.1 -0.5 | 39.84 -.11 | 38.8 +0.3 |
| June 8.2 | 13.55 .08 | 15.1 1.0 | 49.41 .36 | 48.5 1.4 | 33.50 .16 | 38.4 0.9 | 39.74 .09 | 39.0 +0.1 |
| 18.1 | 13.48 .06 | 14.1 1.1 | 49.08 .29 | 47.0 1.8 | 33.36 .19 | 37.4 1.2 | 39.66 .06 | 39.0 0.0 |
| 28.1 | 13.43 .04 | 13.0 1.1 | 48.82 .21 | 45.0 2.2 | 33.26 .08 | 36.1 1.5 | 39.60 .04 | 39.0 -0.2 |
| July 8.1 | 13.40 -.01 | 11.8 1.2 | 48.65 .13 | 42.6 2.5 | 33.20 -.03 | 34.5 1.7 | 39.58 -.01 | 38.7 0.3 |
| 18.1 | 13.41 +.01 | 10.6 +1.2 | 48.57 -.03 | 40.0 -2.7 | 33.19 +.01 | 32.7 -1.9 | 39.58 +.01 | 38.3 -0.5 |
| 28.0 | 13.43 .04 | 9.4 1.2 | 48.58 +.06 | 37.2 2.9 | 33.23 .06 | 30.6 2.1 | 39.60 .04 | 37.8 0.6 |
| Aug. 7.0 | 13.49 .07 | 8.2 1.1 | 48.68 .15 | 34.2 3.0 | 33.31 .11 | 28.4 2.3 | 39.66 .07 | 37.0 0.8 |
| 17.0 | 13.57 .10 | 7.1 1.0 | 48.87 .24 | 31.2 3.1 | 33.44 .15 | 26.0 2.4 | 39.75 .10 | 36.2 0.9 |
| 27.0 | 13.69 .13 | 6.2 0.8 | 49.16 .33 | 28.1 3.1 | 33.62 .20 | 23.6 2.5 | 39.87 .13 | 35.2 1.1 |
| Sept. 5.9 | 13.83 +.16 | 5.4 +0.6 | 49.53 +.41 | 25.0 -3.0 | 33.84 +.25 | 21.1 -2.5 | 40.01 +.16 | 34.0 -1.2 |
| 15.9 | 14.00 .19 | 5.0 +0.3 | 49.98 .50 | 22.0 2.9 | 34.11 .29 | 18.6 2.5 | 40.19 .19 | 32.7 1.4 |
| 25.9 | 14.20 .22 | 4.8 0.0 | 50.52 .58 | 19.1 2.7 | 34.43 .34 | 16.2 2.4 | 40.40 .23 | 31.3 1.5 |
| Oct. 5.8 | 14.44 .25 | 5.0 -0.3 | 51.13 .65 | 16.4 2.5 | 34.79 .38 | 13.8 2.3 | 40.65 .26 | 29.7 1.6 |
| 15.8 | 14.70 .27 | 5.5 0.7 | 51.82 .71 | 14.1 2.2 | 35.18 .42 | 11.6 2.1 | 40.92 .29 | 28.0 1.7 |
| 25.8 | 14.98 +.29 | 6.4 -1.0 | 52.56 +.76 | 12.0 -1.9 | 35.62 +.45 | 9.6 -1.9 | 41.23 +.31 | 26.3 -1.8 |
| Nov. 4.8 | 15.29 .31 | 7.6 1.4 | 53.34 .80 | 10.4 1.4 | 36.08 .47 | 7.8 1.6 | 41.56 .33 | 24.5 1.8 |
| 14.7 | 15.61 .32 | 9.1 1.7 | 54.16 .83 | 9.1 1.0 | 36.56 .49 | 6.3 1.3 | 41.90 .35 | 22.8 1.7 |
| 24.7 | 15.93 .32 | 11.0 1.9 | 54.99 .83 | 8.4 -0.5 | 37.06 .50 | 5.1 1.0 | 42.26 .36 | 21.1 1.6 |
| Dec. 4.7 | 16.26 .31 | 13.0 2.1 | 55.82 .81 | 8.1 0.0 | 37.55 .49 | 4.4 0.6 | 42.62 .36 | 19.5 1.5 |
| 14.7 | 16.57 +.30 | 15.2 -2.2 | 56.61 +.77 | 8.4 +0.5 | 38.03 +.46 | 4.0 -0.1 | 42.98 +.35 | 18.1 -1.3 |
| 24.6 | 16.86 .27 | 17.5 2.3 | 57.36 .70 | 9.2 1.1 | 38.48 .43 | 4.1 +0.3 | 43.32 .32 | 16.9 1.0 |
| 34.6 | 17.12 +.23 | 19.8 -2.2 | 58.02 +.62 | 10.6 +1.6 | 38.89 +.38 | 4.6 +0.7 | 43.62 +.29 | 16.0 -0.7 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | μ Leonis. | | α Leonis. (Regulus.) | | 32 Ursæ Majoris. | | γ^1 Leonis. | |
|------------------------|-----------------------------------|-----------------------|-----------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h ^m 9 46 | +26° 30' | ^h ^m 10 2 | +19° 29' | ^h ^m 10 10 | +65° 38' | ^h ^m 10 13 | +20° 23' |
| (Dec.30.6) | ^s 33.85 +.31 | " 70.7 -0.8 | ^s 33.89 +.29 | " 60.7 -1.5 | ^s 7.70 +.60 | " 57.0 +0.7 | ^s 57.62 +.32 | " 33.3 -1.3 |
| Jan. 9.6 | 34.14 .27 | 70.1 0.5 | 34.17 .26 | 59.3 1.3 | 8.27 .54 | 58.0 1.2 | 57.92 .28 | 32.2 1.0 |
| 19.6 | 34.39 .22 | 69.8 -0.1 | 34.42 .22 | 58.2 1.0 | 8.78 .45 | 59.4 1.7 | 58.19 .24 | 31.4 0.6 |
| 29.6 | 34.59 .17 | 69.8 +0.2 | 34.61 .17 | 57.3 0.8 | 9.18 .35 | 61.3 2.1 | 58.40 .19 | 30.9 -0.3 |
| Feb. 8.5 | 34.74 .12 | 70.1 0.4 | 34.76 .12 | 56.6 0.5 | 9.49 .25 | 63.6 2.4 | 58.57 .14 | 30.7 0.0 |
| 18.5 | 34.83 +.06 | 70.6 +0.6 | 34.86 +.07 | 56.3 -0.2 | 9.69 +.14 | 66.1 +2.6 | 58.69 +.09 | 30.8 +0.2 |
| 28.5 | 34.87 +.01 | 71.3 0.8 | 34.91 +.03 | 56.2 0.0 | 9.77 +.03 | 68.7 2.7 | 58.75 +.04 | 31.2 0.4 |
| Mar. 10.5 | 34.85 -.04 | 72.2 0.9 | 34.91 -.02 | 56.3 +0.2 | 9.75 -.07 | 71.4 2.6 | 58.77 .00 | 31.7 0.6 |
| 20.4 | 34.80 .08 | 73.2 1.0 | 34.88 .06 | 56.6 0.4 | 9.63 .16 | 74.0 2.5 | 58.75 -.04 | 32.4 0.8 |
| 30.4 | 34.70 .11 | 74.3 1.0 | 34.80 .08 | 57.0 0.5 | 9.42 .24 | 76.4 2.3 | 58.68 .07 | 33.2 0.8 |
| Apr. 9.4 | 34.59 -.13 | 75.3 +1.0 | 34.71 -.10 | 57.5 +0.6 | 9.14 -.30 | 78.6 +2.0 | 58.59 -.10 | 34.1 +0.9 |
| 19.3 | 34.45 .14 | 76.2 0.9 | 34.60 .12 | 58.1 0.6 | 8.80 .35 | 80.4 1.6 | 58.48 .12 | 35.0 0.9 |
| 29.3 | 34.30 .15 | 77.1 0.8 | 34.47 .12 | 58.7 0.6 | 8.43 .38 | 81.8 1.1 | 58.36 .13 | 35.8 0.8 |
| May 9.3 | 34.16 .14 | 77.8 0.6 | 34.35 .12 | 59.4 0.6 | 8.04 .39 | 82.7 0.6 | 58.23 .13 | 36.6 0.7 |
| 19.3 | 34.02 .13 | 78.3 0.4 | 34.23 .12 | 60.0 0.6 | 7.65 .38 | 83.1 +0.2 | 58.11 .12 | 37.3 0.6 |
| 29.2 | 33.90 -.11 | 78.7 +0.3 | 34.12 -.11 | 60.5 +0.5 | 7.28 -.36 | 83.0 -0.3 | 57.99 -.11 | 37.8 +0.5 |
| June 8.2 | 33.79 .09 | 78.9 +0.1 | 34.02 .09 | 61.0 0.5 | 6.93 .33 | 82.5 0.8 | 57.88 .10 | 38.2 0.3 |
| 18.2 | 33.70 .07 | 78.9 -0.1 | 33.94 .07 | 61.5 0.4 | 6.61 .29 | 81.4 1.2 | 57.79 .08 | 38.5 +0.2 |
| 28.2 | 33.64 .05 | 78.8 0.2 | 33.87 .05 | 61.8 0.3 | 6.35 .24 | 80.0 1.6 | 57.72 .06 | 38.6 0.0 |
| July 8.1 | 33.61 -.02 | 78.4 0.4 | 33.83 .03 | 62.1 0.2 | 6.14 .15 | 78.2 2.0 | 57.67 .04 | 38.6 -0.1 |
| 18.1 | 33.60 +.01 | 77.9 -0.6 | 33.81 -.01 | 62.3 +0.1 | 5.99 -.11 | 75.9 -2.4 | 57.64 -.01 | 38.4 -0.2 |
| 28.1 | 33.62 .04 | 77.2 0.7 | 33.82 +.02 | 62.4 0.0 | 5.91 -.05 | 73.4 2.6 | 57.64 +.01 | 38.1 0.4 |
| Aug. 7.0 | 33.67 .07 | 76.4 0.9 | 33.85 .04 | 62.3 -0.1 | 5.90 +.02 | 70.7 2.8 | 57.66 .04 | 37.6 0.6 |
| 17.0 | 33.75 .10 | 75.4 1.1 | 33.90 .07 | 62.1 0.3 | 5.95 .09 | 67.7 3.0 | 57.71 .06 | 36.9 0.8 |
| 27.0 | 33.86 .13 | 74.2 1.2 | 33.99 .10 | 61.8 0.5 | 6.08 .16 | 64.6 3.1 | 57.79 .09 | 36.0 0.9 |
| Sept. 6.0 | 34.01 +.16 | 72.9 -1.4 | 34.10 +.13 | 61.2 -0.7 | 6.28 +.24 | 61.4 -3.2 | 57.90 +.12 | 35.0 -1.1 |
| 15.9 | 34.18 .19 | 71.5 1.5 | 34.25 .16 | 60.5 0.8 | 6.56 .31 | 58.2 3.2 | 58.04 .16 | 33.8 1.3 |
| 25.9 | 34.39 .22 | 69.9 1.6 | 34.42 .19 | 59.5 1.0 | 6.90 .38 | 55.1 3.1 | 58.21 .19 | 32.4 1.5 |
| Oct. 5.9 | 34.63 .26 | 68.2 1.7 | 34.63 .22 | 58.4 1.2 | 7.32 .45 | 52.0 3.0 | 58.42 .22 | 30.8 1.6 |
| 15.9 | 34.91 .29 | 66.4 1.8 | 34.88 .25 | 57.0 1.4 | 7.80 .51 | 49.1 2.7 | 58.66 .26 | 29.1 1.8 |
| 25.8 | 35.21 +.22 | 64.6 -1.8 | 35.15 +.28 | 55.5 -1.6 | 8.35 +.57 | 46.5 -2.5 | 58.94 +.22 | 27.3 -1.9 |
| Nov. 4.8 | 35.54 .34 | 62.7 1.8 | 35.45 .31 | 53.8 1.7 | 8.95 .62 | 44.2 2.1 | 59.24 .22 | 25.4 2.0 |
| 14.8 | 35.89 .35 | 60.9 1.8 | 35.77 .33 | 52.0 1.8 | 9.60 .66 | 42.2 1.7 | 59.57 .34 | 23.4 2.0 |
| 24.7 | 36.25 .36 | 59.2 1.7 | 36.10 .34 | 50.1 1.9 | 10.27 .68 | 40.7 1.3 | 59.91 .35 | 21.4 1.9 |
| Dec. 4.7 | 36.62 .36 | 57.6 1.5 | 36.44 .34 | 48.2 1.9 | 10.96 .69 | 39.7 0.8 | 60.27 .36 | 19.6 1.8 |
| 14.7 | 36.98 +.35 | 56.2 -1.3 | 36.78 +.33 | 46.4 -1.8 | 11.65 +.67 | 39.2 -0.2 | 60.62 +.35 | 17.8 -1.6 |
| 24.7 | 37.32 .33 | 55.1 1.0 | 37.11 .31 | 44.6 1.6 | 12.31 .64 | 39.2 +0.3 | 60.97 .33 | 16.3 1.4 |
| 34.6 | 37.64 +.30 | 54.2 -0.7 | 37.41 +.28 | 43.1 -1.4 | 12.93 +.58 | 39.8 +0.9 | 61.29 +.31 | 15.0 -1.2 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | γ Draconis (H.) | | ρ Leonis. | | η Argūs. | | ι Leonis. | |
|------------------------|------------------------------------|---------------------------|------------------------------------|---------------------------|------------------------------------|---------------------------|------------------------------------|---------------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. |
| | ^h ^m 10 25 | +76° 15' | ^h ^m 10 27 | + 9° 51' | ^h ^m 10 40 | -59° 6' | ^h ^m 10 43 | +11° 7' |
| (Dec.30.6) | ^s 51.48+1.00 | ["] 76.4 +0.9 | ^s 4.10 +.31 | ["] 64.5 -1.7 | ^s 50.21 +.44 | ["] 20.2 -2.9 | ^s 31.38 +.32 | ["] 20.4 -1.8 |
| Jan. 9.6 | 52.44 .90 | 77.6 1.4 | 4.39 .97 | 62.9 1.5 | 50.63 .39 | 23.2 3.2 | 31.68 .29 | 18.8 1.5 |
| 19.6 | 53.28 .77 | 79.2 1.9 | 4.65 .93 | 61.5 1.3 | 50.98 .32 | 26.6 3.5 | 31.95 .25 | 17.4 1.2 |
| 29.6 | 53.98 .61 | 81.4 2.3 | 4.86 .19 | 60.4 1.0 | 51.27 .25 | 30.1 3.7 | 32.18 .21 | 16.2 1.0 |
| Feb. 8.5 | 54.51 .44 | 83.9 2.6 | 5.04 .15 | 59.5 0.7 | 51.48 .17 | 33.8 3.7 | 32.37 .16 | 15.4 0.7 |
| 18.5 | 54.86+ .26 | 86.6 +2.9 | 5.16 +.10 | 59.0 -0.4 | 51.61 +.09 | 37.6 -3.7 | 32.51 +.11 | 14.9 -0.4 |
| 28.5 | 55.03+ .08 | 89.6 3.0 | 5.23 .05 | 58.6 -0.2 | 51.66 +.02 | 41.3 3.6 | 32.60 .07 | 14.6 -0.1 |
| Mar. 10.5 | 55.01- .10 | 92.6 2.9 | 5.26 +.01 | 58.6 0.0 | 51.64 -.05 | 44.8 3.4 | 32.64 +.03 | 14.6 +0.1 |
| 20.4 | 54.81 .37 | 95.5 2.8 | 5.24 -.03 | 58.7 +0.2 | 51.55 .11 | 48.1 3.2 | 32.65 -.01 | 14.8 0.3 |
| 30.4 | 54.46 .42 | 98.2 2.5 | 5.20 .06 | 59.0 0.4 | 51.40 .17 | 51.2 2.9 | 32.61 .05 | 15.2 0.4 |
| Apr. 9.4 | 53.98- .54 | 100.5 +2.2 | 5.12 -.08 | 59.4 +0.5 | 51.20 -.22 | 53.9 -2.5 | 32.55 -.07 | 15.7 +0.5 |
| 19.4 | 53.38 .63 | 102.6 1.8 | 5.03 .10 | 60.0 0.6 | 50.96 .26 | 56.2 2.1 | 32.47 .09 | 16.3 0.6 |
| 29.3 | 52.71 .70 | 104.1 1.3 | 4.92 .11 | 60.6 0.6 | 50.69 .29 | 58.1 1.6 | 32.37 .10 | 16.9 0.7 |
| May 9.3 | 51.99 .73 | 105.1 0.7 | 4.80 .11 | 61.2 0.6 | 50.38 .31 | 59.5 1.2 | 32.26 .11 | 17.6 0.7 |
| 19.3 | 51.24 .74 | 105.5 +0.2 | 4.69 .11 | 61.8 0.6 | 50.07 .32 | 60.4 0.7 | 32.15 .11 | 18.3 0.6 |
| 29.3 | 50.51- .73 | 105.5 -0.4 | 4.58 -.10 | 62.4 +0.6 | 49.74 -.32 | 60.9 -0.2 | 32.04 -.11 | 18.9 +0.6 |
| June 8.2 | 49.81 .67 | 104.8 0.9 | 4.48 .09 | 63.0 0.5 | 49.42 .32 | 60.8 +0.3 | 31.93 .10 | 19.5 0.5 |
| 18.2 | 49.16 .61 | 103.7 1.4 | 4.39 .08 | 63.5 0.5 | 49.10 .31 | 60.3 0.8 | 31.84 .09 | 20.0 0.5 |
| 28.2 | 48.59 .53 | 102.0 1.8 | 4.31 .07 | 64.0 0.4 | 48.80 .29 | 59.2 1.3 | 31.76 .07 | 20.5 0.4 |
| July 8.1 | 48.10 .43 | 100.0 2.3 | 4.26 .05 | 64.4 0.3 | 48.53 .26 | 57.8 1.7 | 31.69 .06 | 20.8 0.3 |
| 18.1 | 47.72- .32 | 97.5 -2.6 | 4.22 -.03 | 64.7 +0.2 | 48.29 -.22 | 55.9 +2.1 | 31.65 -.04 | 21.1 +0.2 |
| 28.1 | 47.46 .21 | 94.7 2.9 | 4.20 .00 | 64.8 +0.1 | 48.09 .18 | 53.6 2.4 | 31.62 -.02 | 21.2 +0.1 |
| Aug. 7.1 | 47.31- .09 | 91.6 3.2 | 4.21 +.02 | 64.9 0.0 | 47.93 .12 | 51.1 2.6 | 31.61 .00 | 21.2 -0.1 |
| 17.0 | 47.28+ .04 | 88.3 3.4 | 4.24 .05 | 64.8 -0.1 | 47.84 -.06 | 48.4 2.8 | 31.63 +.03 | 21.0 0.2 |
| 27.0 | 47.39 .17 | 84.9 3.5 | 4.30 .07 | 64.6 0.3 | 47.80 .00 | 45.6 2.8 | 31.67 .06 | 20.6 0.4 |
| Sept. 6.0 | 47.62+ .30 | 81.4 -3.5 | 4.39 +.10 | 64.2 -0.5 | 47.84 +.07 | 42.8 +2.7 | 31.74 +.09 | 20.1 -0.6 |
| 16.0 | 47.99 .43 | 77.8 3.5 | 4.51 .13 | 63.5 0.7 | 47.94 .14 | 40.0 2.6 | 31.85 .12 | 19.4 0.8 |
| 25.9 | 48.48 .56 | 74.4 3.4 | 4.66 .17 | 62.6 1.0 | 48.12 .22 | 37.5 2.4 | 31.98 .15 | 18.4 1.1 |
| Oct. 5.9 | 49.10 .68 | 71.0 3.2 | 4.85 .20 | 61.6 1.2 | 48.38 .29 | 35.4 2.0 | 32.16 .19 | 17.2 1.3 |
| 15.9 | 49.84 .79 | 67.9 3.0 | 5.07 .24 | 60.3 1.4 | 48.70 .36 | 33.6 1.5 | 32.36 .22 | 15.8 1.5 |
| 25.8 | 50.69+ .29 | 65.1 -2.7 | 5.32 +.27 | 58.7 -1.6 | 49.09 +.42 | 32.4 +1.0 | 32.60 +.26 | 14.2 -1.7 |
| Nov. 4.8 | 51.63 .98 | 62.6 2.2 | 5.61 .29 | 57.0 1.8 | 49.54 .46 | 31.7 +0.4 | 32.88 .29 | 12.4 1.9 |
| 14.8 | 52.66 1.05 | 60.6 1.8 | 5.92 .32 | 55.2 1.9 | 50.02 .50 | 31.6 -0.2 | 33.18 .31 | 10.5 2.0 |
| 24.7 | 53.74 1.10 | 59.0 1.3 | 6.25 .33 | 53.2 2.0 | 50.53 .52 | 32.1 0.9 | 33.51 .33 | 8.4 2.0 |
| Dec. 4.7 | 54.85 1.11 | 58.0 0.7 | 6.58 .34 | 51.2 2.0 | 51.06 .52 | 33.3 1.5 | 33.85 .34 | 6.4 2.0 |
| 14.7 | 55.96+1.10 | 57.5 -0.1 | 6.93 +.34 | 49.2 -1.9 | 51.58 +.50 | 35.1 -2.1 | 34.19 +.34 | 4.4 -2.0 |
| 24.7 | 57.04 1.05 | 57.7 +0.5 | 7.26 .32 | 47.3 1.8 | 52.07 .47 | 37.4 2.6 | 34.53 .33 | 2.4 1.9 |
| 34.6 | 58.06+ .98 | 58.5 +1.1 | 7.57 +.30 | 45.6 -1.6 | 52.52 +.43 | 40.2 -3.0 | 34.85 +.31 | 0.6 -1.7 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Ursæ Majoris. | | δ Leonis. | | δ Crateris. | | γ Leonis. | | |
|------------------------|---------------------------------------|-----------------------|--------------------------------------|-----------------------|---------------------------------------|-----------------------|---------------------------------------|-----------------------|-----------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | |
| | ^h 10 ^m 56 | +62° 19' | ^h 11 ^m 8 | +21° 6' | ^h 11 ^m 13 | -14° 11' | ^h 11 ^m 22 | + 3° 27' | |
| (Dec.30.7) | ^s 60.18 +.59 | 71.3 0.0 | ^s 18.28 +.34 | 73.3 -1.5 | ^s 52.99 +.32 | " -2.4 | ^s 19.35 +.33 | 27.3 -2.0 | |
| Jan. 9.7 | 60.75 .54 | 71.6 +0.5 | 18.61 .32 | 71.9 1.2 | 53.30 .30 | 12.4 2.4 | 19.67 .30 | 25.3 1.9 | |
| 19.6 | 61.26 .48 | 72.4 1.1 | 18.91 .28 | 70.8 0.9 | 53.58 .26 | 14.8 2.4 | 19.96 .27 | 23.4 1.7 | |
| 29.6 | 61.71 .40 | 73.7 1.6 | 19.18 .24 | 70.2 0.5 | 53.82 .22 | 17.2 2.3 | 20.21 .23 | 21.8 1.5 | |
| Feb. 8.6 | 62.07 .32 | 75.5 2.0 | 19.40 .19 | 69.8 -0.2 | 54.03 .18 | 19.4 2.1 | 20.43 .19 | 20.5 1.2 | |
| | 18.5 | 62.34 +.22 | 77.6 +2.3 | 19.57 +.15 | 69.8 +0.1 | 54.19 +.13 | 21.4 -1.9 | 20.60 +.15 | 19.4 -0.9 |
| | 28.5 | 62.52 .13 | 80.1 2.5 | 19.69 .10 | 70.1 0.4 | 54.30 .09 | 23.2 1.7 | 20.73 .10 | 18.6 0.7 |
| Mar. 10.5 | 62.60 +.03 | 82.7 2.6 | 19.76 .05 | 70.6 0.7 | 54.37 .05 | 24.8 1.4 | 20.81 .06 | 18.1 0.4 | |
| 20.5 | 62.58 -.05 | 85.4 2.6 | 19.79 +.01 | 71.4 0.9 | 54.39 +.01 | 26.2 1.2 | 20.55 +.02 | 17.8 -0.2 | |
| 30.4 | 62.49 .13 | 87.9 2.5 | 19.78 -.03 | 72.4 1.0 | 54.38 -.02 | 27.3 1.0 | 20.85 -.01 | 17.7 0.0 | |
| Apr. 9.4 | 62.32 -.20 | 90.4 +2.3 | 19.74 -.06 | 73.4 +1.1 | 54.34 -.05 | 28.1 -0.7 | 20.83 -.04 | 17.9 +0.2 | |
| 19.4 | 62.09 .25 | 92.6 2.0 | 19.66 .08 | 74.5 1.1 | 54.28 .07 | 28.7 0.5 | 20.78 .06 | 18.2 0.4 | |
| 29.3 | 61.81 .29 | 94.4 1.6 | 19.57 .10 | 75.5 1.0 | 54.20 .09 | 29.0 -0.2 | 20.70 .06 | 18.6 0.5 | |
| May 9.3 | 61.50 .32 | 95.8 1.2 | 19.47 .11 | 76.5 0.9 | 54.10 .10 | 29.2 0.0 | 20.62 .09 | 19.1 0.5 | |
| 19.3 | 61.18 .33 | 96.8 0.8 | 19.35 .11 | 77.4 0.8 | 54.00 .11 | 29.1 +0.2 | 20.52 .10 | 19.6 0.6 | |
| | 29.3 | 60.85 -.33 | 97.4 +0.3 | 19.24 -.11 | 78.2 +0.7 | 53.89 -.11 | 28.8 +0.4 | 20.42 -.10 | 20.3 +0.6 |
| June 8.2 | 60.52 .31 | 97.4 -0.2 | 19.13 .10 | 78.8 0.5 | 53.78 .11 | 28.3 0.6 | 20.32 .10 | 20.9 0.6 | |
| 18.2 | 60.22 .29 | 97.0 0.7 | 19.02 .10 | 79.3 0.3 | 53.67 .10 | 27.7 0.7 | 20.23 .09 | 21.5 0.6 | |
| 28.2 | 59.94 .26 | 96.1 1.1 | 18.92 .09 | 79.6 +0.2 | 53.58 .09 | 26.9 0.9 | 20.14 .08 | 22.1 0.6 | |
| July 8.2 | 59.70 .22 | 94.7 1.5 | 18.84 .07 | 79.6 0.0 | 53.49 .08 | 26.0 1.0 | 20.06 .07 | 22.6 0.5 | |
| | 18.1 | 59.50 -.18 | 92.9 -1.9 | 18.78 -.06 | 79.5 -0.2 | 53.41 -.07 | 24.9 +1.1 | 19.99 -.06 | 23.1 +0.5 |
| | 28.1 | 59.35 .13 | 90.8 2.3 | 18.73 .04 | 79.2 0.4 | 53.34 .06 | 23.8 1.1 | 19.93 .05 | 23.6 0.4 |
| Aug. 7.1 | 59.25 .07 | 88.3 2.6 | 18.70 -.02 | 78.7 0.6 | 53.30 .04 | 22.7 1.1 | 19.89 .03 | 23.9 0.3 | |
| 17.0 | 59.20 -.02 | 85.6 2.9 | 18.69 +.01 | 77.9 0.8 | 53.27 -.01 | 21.6 1.1 | 19.87 -.01 | 24.1 +0.1 | |
| 27.0 | 59.21 +.04 | 82.6 3.1 | 18.71 .03 | 77.0 1.0 | 53.27 +.02 | 20.6 1.0 | 19.87 +.01 | 24.2 0.0 | |
| Sept. 6.0 | 59.29 +.11 | 79.4 -3.2 | 18.76 +.07 | 75.8 -1.3 | 53.30 +.05 | 19.7 +0.8 | 19.90 +.04 | 24.1 -0.2 | |
| 16.0 | 59.43 .18 | 76.1 3.3 | 18.84 .10 | 74.4 1.5 | 53.37 .08 | 19.0 0.6 | 19.96 .08 | 23.7 0.4 | |
| 25.9 | 59.64 .24 | 72.8 3.3 | 18.96 .13 | 72.9 1.7 | 53.47 .12 | 18.5 0.4 | 20.06 .11 | 23.2 0.7 | |
| Oct. 5.9 | 59.92 .31 | 69.5 3.3 | 19.11 .17 | 71.1 1.9 | 53.61 .16 | 18.2 +0.1 | 20.19 .15 | 22.3 0.9 | |
| 15.9 | 60.26 .38 | 66.2 3.2 | 19.30 .21 | 69.2 2.0 | 53.79 .20 | 18.4 -0.3 | 20.36 .19 | 21.3 1.2 | |
| | 25.9 | 60.68 +.44 | 63.1 -3.0 | 19.54 +.25 | 67.0 -2.1 | 54.01 +.24 | 18.8 -0.6 | 20.57 +.22 | 20.0 -1.4 |
| Nov. 4.8 | 61.15 .50 | 60.2 2.7 | 19.80 .28 | 64.8 2.2 | 54.27 .27 | 19.6 1.0 | 20.82 .26 | 18.4 1.7 | |
| 14.8 | 61.68 .55 | 57.7 2.4 | 20.10 .31 | 62.6 2.3 | 54.56 .30 | 20.8 1.3 | 21.10 .29 | 16.6 1.9 | |
| 24.8 | 62.25 .59 | 55.5 2.0 | 20.43 .24 | 60.3 2.2 | 54.87 .32 | 22.3 1.7 | 21.40 .32 | 14.6 2.0 | |
| Dec. 4.7 | 62.85 .61 | 53.7 1.5 | 20.78 .25 | 58.2 2.1 | 55.21 .24 | 24.2 2.0 | 21.73 .33 | 12.5 2.1 | |
| | 14.7 | 63.47 +.61 | 52.5 -1.0 | 21.14 +.36 | 56.1 -1.9 | 55.55 +.34 | 26.2 -2.2 | 22.07 +.34 | 10.4 -2.2 |
| | 24.7 | 64.08 .60 | 51.8 -0.4 | 21.50 .25 | 54.2 1.7 | 55.89 .23 | 28.5 2.3 | 22.41 .23 | 8.2 2.1 |
| | 34.7 | 64.68 +.57 | 51.7 +0.1 | 21.81 +.23 | 52.6 -1.4 | 56.22 +.21 | 30.9 -2.4 | 22.74 +.22 | 6.1 -2.0 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | λ Draconis. | | ν Leonis. | | β Leonis. | | γ Ursæ Majoris. | |
|------------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h ^m 11 24 | +69° 55' | ^h ^m 11 31 | — 0° 13' | ^h ^m 11 43 | +15° 10' | ^h ^m 11 48 | +54° 17' |
| (Dec. 30.7) | ^s 56.07 +.77 | 45.2 —0.1 | ^s 21.47 +.33 | 14.2 —2.2 | ^s 29.37 +.34 | 52.7 —1.9 | ^s 5.52 +.50 | 51.9 —0.9 |
| Jan. 9.7 | 56.82 .73 | 45.4 +0.4 | 21.79 .30 | 16.3 2.0 | 29.70 .32 | 51.0 1.6 | 6.02 .48 | 51.2 —0.4 |
| 19.6 | 57.52 .66 | 46.1 1.0 | 22.08 .37 | 18.2 1.9 | 30.01 .29 | 49.5 1.3 | 6.48 .44 | 51.2 +0.2 |
| 29.6 | 58.14 .57 | 47.4 1.5 | 22.34 .24 | 20.0 1.7 | 30.29 .26 | 48.3 1.0 | 6.90 .39 | 51.7 0.7 |
| Feb. 8.6 | 58.66 .47 | 49.2 2.0 | 22.56 .20 | 21.6 1.4 | 30.53 .22 | 47.5 0.6 | 7.27 .33 | 52.7 1.2 |
| 18.5 | 59.08 +.35 | 51.5 +2.4 | 22.74 +.16 | 22.9 —1.2 | 30.72 +.17 | 47.0 —0.3 | 7.57 +.27 | 54.2 +1.7 |
| 28.5 | 59.37 .23 | 54.1 2.7 | 22.87 .11 | 23.9 0.9 | 30.88 .13 | 46.9 0.0 | 7.80 .20 | 56.1 2.0 |
| Mar. 10.5 | 59.53 +.10 | 56.9 2.8 | 22.96 .07 | 24.7 0.6 | 30.98 .08 | 47.0 +0.3 | 7.96 .12 | 58.3 2.3 |
| 20.5 | 59.57 —.02 | 59.8 2.9 | 23.01 +.03 | 25.2 0.4 | 31.05 +.04 | 47.4 0.5 | 8.04 +.05 | 60.7 2.4 |
| 30.4 | 59.49 .13 | 62.7 2.8 | 23.03 .00 | 25.5 —0.2 | 31.07 .00 | 48.1 0.7 | 8.06 —.09 | 63.2 2.5 |
| Apr. 9.4 | 59.30 —.23 | 65.4 +2.6 | 23.01 —.03 | 25.6 0.0 | 31.06 —.03 | 48.9 +0.8 | 8.00 —.08 | 65.7 +2.4 |
| 19.4 | 59.02 .32 | 67.8 2.3 | 22.96 .05 | 25.4 +0.2 | 31.02 .05 | 49.8 0.9 | 7.90 .13 | 68.1 2.3 |
| 29.4 | 58.66 .38 | 70.0 1.9 | 22.90 .07 | 25.2 0.3 | 30.96 .07 | 50.7 1.0 | 7.75 .17 | 70.2 2.0 |
| May 9.3 | 58.25 .43 | 71.7 1.5 | 22.82 .08 | 24.8 0.4 | 30.88 .09 | 51.7 0.9 | 7.56 .20 | 72.2 1.7 |
| 19.3 | 57.80 .46 | 73.0 1.0 | 22.73 .09 | 24.4 0.5 | 30.79 .10 | 52.6 0.9 | 7.35 .22 | 73.7 1.3 |
| 29.3 | 57.32 —.48 | 73.8 +0.5 | 22.63 —.10 | 23.8 +0.6 | 30.69 —.10 | 53.4 +0.8 | 7.12 —.23 | 74.8 +0.9 |
| June 8.3 | 56.84 .47 | 74.0 0.0 | 22.53 .10 | 23.2 0.6 | 30.58 .10 | 54.2 0.7 | 6.88 .24 | 75.6 +0.5 |
| 18.2 | 56.37 .46 | 73.7 —0.5 | 22.44 .09 | 22.6 0.6 | 30.48 .10 | 54.8 0.6 | 6.65 .23 | 75.9 0.0 |
| 28.2 | 55.93 .43 | 72.9 1.0 | 22.35 .09 | 22.0 0.6 | 30.38 .10 | 55.3 0.4 | 6.42 .22 | 75.7 —0.4 |
| July 8.2 | 55.52 .38 | 71.6 1.5 | 22.26 .08 | 21.4 0.6 | 30.29 .09 | 55.6 0.2 | 6.20 .21 | 75.1 0.8 |
| 18.1 | 55.16 —.33 | 69.8 —2.0 | 22.19 —.07 | 20.8 +0.6 | 30.21 —.08 | 55.8 +0.1 | 6.01 —.19 | 74.0 —1.2 |
| 28.1 | 54.85 .27 | 67.6 2.4 | 22.12 .06 | 20.2 0.5 | 30.13 .07 | 55.8 —0.1 | 5.83 .16 | 72.5 1.6 |
| Aug. 7.1 | 54.61 .20 | 65.0 2.7 | 22.07 .04 | 19.7 0.4 | 30.08 .05 | 55.6 0.3 | 5.69 .12 | 70.7 2.0 |
| 17.1 | 54.45 .13 | 62.1 3.0 | 22.04 —.02 | 19.3 0.3 | 30.04 —.03 | 55.2 0.5 | 5.59 .09 | 68.4 2.4 |
| 27.0 | 54.36 —.05 | 58.9 3.3 | 22.04 +.01 | 19.1 +0.2 | 30.02 .00 | 54.5 0.7 | 5.52 —.04 | 65.9 2.7 |
| Sept. 6.0 | 54.35 +.04 | 55.5 —3.5 | 22.06 +.04 | 19.0 0.0 | 30.03 +.03 | 53.7 —0.9 | 5.50 .00 | 63.1 —2.9 |
| 16.0 | 54.43 .13 | 52.0 3.6 | 22.11 .07 | 19.1 —0.2 | 30.07 .06 | 52.7 1.1 | 5.53 +.05 | 60.1 3.1 |
| 26.0 | 54.61 .22 | 48.4 3.6 | 22.20 .10 | 19.4 0.5 | 30.14 .09 | 51.4 1.4 | 5.61 .11 | 56.9 3.3 |
| Oct. 5.9 | 54.88 .31 | 44.7 3.6 | 22.32 .14 | 20.0 0.7 | 30.26 .13 | 49.9 1.6 | 5.75 .17 | 53.6 3.3 |
| 15.9 | 55.24 .40 | 41.2 3.5 | 22.48 .18 | 20.9 1.0 | 30.41 .17 | 48.2 1.6 | 5.95 .23 | 50.2 3.4 |
| 25.9 | 55.69 +.50 | 37.8 —3.2 | 22.68 +.22 | 22.1 —1.3 | 30.60 +.21 | 46.2 —2.0 | 6.22 +.29 | 46.8 —3.3 |
| Nov. 4.8 | 56.24 .59 | 34.6 3.0 | 22.92 .26 | 23.5 1.5 | 30.84 .25 | 44.2 2.2 | 6.54 .35 | 43.6 3.1 |
| 14.8 | 56.87 .66 | 31.8 2.7 | 23.19 .29 | 25.2 1.8 | 31.11 .29 | 41.9 2.3 | 6.91 .40 | 40.5 2.9 |
| 24.8 | 57.56 .72 | 29.3 2.2 | 23.50 .31 | 27.0 2.0 | 31.41 .32 | 39.6 2.3 | 7.34 .44 | 37.7 2.6 |
| Dec. 4.8 | 58.31 .76 | 27.3 1.7 | 23.82 .33 | 29.1 2.1 | 31.74 .34 | 37.3 2.3 | 7.80 .47 | 35.2 2.2 |
| 14.7 | 59.09 +.79 | 25.8 —1.2 | 24.16 +.34 | 31.2 —2.2 | 32.08 +.35 | 35.1 —2.2 | 8.30 +.50 | 33.2 —1.8 |
| 24.7 | 59.88 .78 | 25.0 —0.6 | 24.50 .33 | 33.4 2.2 | 32.43 .34 | 33.0 2.0 | 8.80 .51 | 31.6 1.3 |
| 34.7 | 60.66 +.76 | 24.7 0.0 | 24.83 +.32 | 35.6 —2.1 | 32.77 +.33 | 31.0 —1.8 | 9.31 +.50 | 30.6 —0.8 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | o Virginis. | | 4 Draconis (H.) | | γ Corvi. | | β Chamæleonis. | |
|------------------------|------------------------------------|-----------------------|-----------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination South. |
| | ^h ^m 11 59 | + [°] 9 19 | ^h ^m 12 7 | +78° 12' | ^h ^m 12 10 | —16° 56' | ^h ^m 12 11 | —78° 41' |
| (Dec.30.7) | ^s 38.66 +.34 | " 79.9 —2.1 | ^s 6.30+1.23 | " 65.2 —0.5 | ^s 11.18 +.34 | " 1.4 —2.2 | ^s 56.58+1.20 | " 58.5 —1.4 |
| Jan. 9.7 | 38.99 .32 | 77.9 1.8 | 7.52 1.20 | 65.0 +0.1 | 11.51 .32 | 3.7 2.3 | 57.76 1.13 | 60.3 2.0 |
| 19.7 | 39.30 .30 | 76.2 1.6 | 8.69 1.12 | 65.4 0.7 | 11.83 .30 | 6.0 2.3 | 58.85 1.03 | 62.6 2.5 |
| 29.6 | 39.58 .27 | 74.7 1.3 | 9.77 1.02 | 66.5 1.3 | 12.12 .27 | 8.4 2.2 | 59.83 .91 | 65.3 3.0 |
| Feb. 8.6 | 39.83 .23 | 73.6 1.0 | 10.72 .88 | 68.1 1.9 | 12.37 .23 | 10.6 2.1 | 60.67 .77 | 68.5 3.3 |
| 18.6 | 40.04 +.18 | 72.7 —0.7 | 11.52+ .71 | 70.3 +2.3 | 12.58 +.19 | 12.8 —2.0 | 61.36+ .60 | 72.0 —3.6 |
| 28.6 | 40.20 .14 | 72.2 0.4 | 12.14 .52 | 72.8 2.7 | 12.75 .15 | 14.8 1.8 | 61.88 .44 | 75.7 3.8 |
| Mar. 10.5 | 40.32 .10 | 72.0 —0.1 | 12.56 .32 | 75.7 2.9 | 12.88 .11 | 16.5 1.6 | 62.23 .27 | 79.5 3.9 |
| 20.5 | 40.40 .06 | 72.1 +0.2 | 12.77+ .11 | 78.7 3.0 | 12.97 .07 | 18.0 1.4 | 62.42+ .10 | 83.4 2.8 |
| 30.5 | 40.45 +.02 | 72.4 0.4 | 12.78— .08 | 81.7 3.0 | 13.02 +.03 | 19.3 1.1 | 62.43— .07 | 87.2 3.7 |
| Apr. 9.5 | 40.45 —.01 | 72.8 +0.6 | 12.60— .27 | 84.7 +2.9 | 13.04 .00 | 20.4 —0.9 | 62.28— .22 | 90.9 —3.6 |
| 19.4 | 40.43 .03 | 73.5 0.7 | 12.24 .44 | 87.5 2.6 | 13.03 —.03 | 21.2 0.6 | 61.98 .37 | 94.4 3.4 |
| 29.4 | 40.39 .05 | 74.2 0.8 | 11.72 .56 | 90.0 2.3 | 12.99 .05 | 21.8 0.4 | 61.54 .51 | 97.6 3.1 |
| May 9.4 | 40.32 .07 | 75.0 0.8 | 11.08 .70 | 92.1 1.9 | 12.93 .07 | 22.2 —0.2 | 60.96 .63 | 100.5 2.7 |
| 19.3 | 40.24 .08 | 75.8 0.8 | 10.32 .78 | 93.8 1.4 | 12.86 .06 | 22.4 0.0 | 60.27 .74 | 103.0 2.3 |
| 29.3 | 40.16 —.09 | 76.5 +0.7 | 9.50— .85 | 94.9 +0.9 | 12.77 —.09 | 22.4 +0.2 | 59.48— .83 | 105.1 —1.8 |
| June 8.3 | 40.06 .09 | 77.3 0.7 | 8.63 .88 | 95.5 +0.3 | 12.68 .10 | 22.2 0.4 | 58.61 .20 | 106.7 1.3 |
| 18.3 | 39.96 .10 | 78.0 0.6 | 7.74 .88 | 95.6 —0.2 | 12.58 .10 | 21.8 0.5 | 57.69 .24 | 107.7 0.8 |
| 28.2 | 39.87 .10 | 78.5 0.5 | 6.86 .87 | 95.1 0.7 | 12.47 .11 | 21.2 0.7 | 56.72 .27 | 108.2 —0.2 |
| July 8.2 | 39.77 .09 | 79.0 0.4 | 6.01 .82 | 94.1 1.3 | 12.36 .10 | 20.5 0.8 | 55.75 .26 | 108.2 +0.3 |
| 18.2 | 39.68 —.08 | 79.4 +0.3 | 5.21— .76 | 92.5 —1.8 | 12.26 —.10 | 19.7 +0.9 | 54.79— .23 | 107.6 +0.8 |
| 28.1 | 39.60 .07 | 79.6 +0.2 | 4.48 .68 | 90.5 2.2 | 12.16 .09 | 18.8 1.0 | 53.88 .87 | 106.5 1.3 |
| Aug. 7.1 | 39.54 .06 | 79.6 0.0 | 3.85 .58 | 88.0 2.6 | 12.08 .08 | 17.8 1.1 | 53.05 .78 | 104.8 1.8 |
| 17.1 | 39.49 .04 | 79.5 —0.2 | 3.32 .47 | 85.2 3.0 | 12.00 .06 | 16.8 1.1 | 52.32 .66 | 102.8 2.2 |
| 27.1 | 39.46 —.02 | 79.3 0.4 | 2.91 .34 | 82.0 3.3 | 11.95 .04 | 15.8 1.0 | 51.73 .51 | 100.3 2.6 |
| Sept. 6.0 | 39.45 +.01 | 78.8 —0.6 | 2.64— .20 | 78.5 —3.6 | 11.93 —.01 | 14.9 +0.9 | 51.30— .34 | 97.6 +2.8 |
| 16.0 | 39.47 .04 | 78.1 0.8 | 2.51— .06 | 74.9 3.7 | 11.94 +.02 | 14.1 0.8 | 51.05— .15 | 94.7 2.9 |
| 26.0 | 39.53 .07 | 77.1 1.0 | 2.53+ .10 | 71.1 3.8 | 11.98 .06 | 13.4 0.6 | 51.00+ .06 | 91.7 3.0 |
| Oct. 6.0 | 39.63 .11 | 76.0 1.3 | 2.71 .24 | 67.2 3.8 | 12.07 .11 | 13.0 +0.3 | 51.16 .26 | 88.7 2.9 |
| 15.9 | 39.76 .15 | 74.6 1.5 | 3.05 .46 | 63.4 3.8 | 12.19 .15 | 12.9 0.0 | 51.53 .47 | 85.9 2.7 |
| 25.9 | 39.94 +.19 | 72.9 —1.7 | 3.56+ .59 | 59.6 —3.6 | 12.37 +.19 | 13.0 —0.3 | 52.11+ .67 | 83.4 +2.3 |
| Nov. 4.9 | 40.15 .23 | 71.0 1.9 | 4.22 .74 | 56.1 3.4 | 12.58 .24 | 13.6 0.6 | 52.87 .85 | 81.3 1.9 |
| 14.8 | 40.41 .27 | 69.0 2.1 | 5.04 .89 | 52.9 3.1 | 12.84 .28 | 14.5 0.9 | 53.80 1.00 | 79.6 1.4 |
| 24.8 | 40.70 .30 | 66.8 2.2 | 6.00 1.01 | 50.0 2.6 | 13.14 .31 | 15.7 1.3 | 54.86 1.11 | 78.5 0.8 |
| Dec. 4.8 | 41.02 .32 | 64.6 2.3 | 7.07 1.11 | 47.6 2.1 | 13.46 .33 | 17.3 1.6 | 56.03 1.19 | 78.0 +0.2 |
| 14.8 | 41.35 +.34 | 62.3 —2.2 | 8.22+1.18 | 45.8 —1.6 | 13.80 +.34 | 19.1 —1.9 | 57.25+1.23 | 78.1 —0.5 |
| 24.7 | 41.70 .34 | 60.1 2.1 | 9.44 1.22 | 44.5 0.9 | 14.14 .35 | 21.2 2.1 | 58.49 1.22 | 78.9 1.1 |
| 34.7 | 42.04 +.33 | 58.0 —2.0 | 10.66+1.22 | 43.8 —0.3 | 14.49 +.34 | 23.4 —2.2 | 59.71+1.19 | 80.3 —1.6 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | η Virginis. | | α^1 Crucis. | | β Corvi. | | κ Draconis. | |
|------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---|---------------------------------------|---|---------------------------------------|---|
| | Right Ascension. | Declination South. | Right Ascension. | Declination South. | Right Ascension. | Declination South. | Right Ascension. | Declination North. |
| | ^h 12 ^m 14 | [°] — 0 ['] 3 | ^h 12 ^m 20 | [°] — 62 ['] 29 | ^h 12 ^m 28 | [°] — 22 ['] 47 | ^h 12 ^m 28 | [°] + 70 ['] 22 |
| (Dec. 30.7) | 18.92 +.33 | 35.1 —.2 | 31.18 +.57 | 18.2 —1.7 | 38.67 +.36 | 25.6 —2.1 | 49.52 +.70 | 66.9 —1.0 |
| Jan. 9.7 | 19.25 .39 | 37.2 2.1 | 31.75 .55 | 20.1 2.2 | 39.02 .34 | 27.8 2.3 | 50.31 .77 | 66.2 —0.4 |
| 19.7 | 19.56 .30 | 39.2 1.9 | 32.29 .51 | 22.5 2.6 | 39.35 .39 | 30.2 2.4 | 51.07 .74 | 66.1 +0.2 |
| 29.6 | 19.85 .27 | 41.1 1.7 | 32.78 .46 | 25.4 3.0 | 39.66 .29 | 32.6 2.4 | 51.79 .68 | 66.7 0.8 |
| Feb. 8.6 | 20.10 .23 | 42.7 1.5 | 33.20 .39 | 28.5 3.2 | 39.93 .25 | 35.0 2.4 | 52.43 .60 | 67.9 1.4 |
| 18.6 | 20.32 +.19 | 44.0 —1.2 | 33.56 +.39 | 31.9 —3.4 | 40.17 +.21 | 37.3 —2.3 | 52.99 +.50 | 69.6 +2.0 |
| 28.6 | 20.49 .15 | 45.1 0.9 | 33.84 .25 | 35.4 3.5 | 40.36 .17 | 39.5 2.1 | 53.44 .39 | 71.8 2.4 |
| Mar. 10.5 | 20.62 .11 | 45.9 0.6 | 34.06 .17 | 39.0 3.6 | 40.51 .13 | 41.6 1.9 | 53.78 .27 | 74.4 2.7 |
| 20.5 | 20.72 .07 | 46.4 0.4 | 34.19 .10 | 42.5 3.5 | 40.62 .09 | 43.4 1.7 | 53.99 .15 | 77.2 2.9 |
| 30.5 | 20.77 .04 | 46.7 —0.2 | 34.25 +.03 | 46.0 3.4 | 40.69 .05 | 45.1 1.5 | 54.08 +.03 | 80.1 2.9 |
| Apr. 9.5 | 20.80 +.01 | 46.8 0.0 | 34.25 —.04 | 49.3 —3.2 | 40.73 +.02 | 46.5 —1.3 | 54.05 —.08 | 83.0 +2.9 |
| 19.4 | 20.79 —.02 | 46.6 +0.2 | 34.18 .10 | 52.4 2.9 | 40.74 —.01 | 47.7 1.1 | 53.91 .19 | 85.9 2.6 |
| 29.4 | 20.76 .04 | 46.4 0.3 | 34.05 .15 | 55.2 2.6 | 40.72 .03 | 48.7 0.8 | 53.67 .28 | 88.6 2.5 |
| May 9.4 | 20.71 .06 | 46.0 0.4 | 33.87 .20 | 57.6 2.3 | 40.67 .05 | 49.4 0.6 | 53.35 .35 | 90.9 2.1 |
| 19.3 | 20.65 .07 | 45.5 0.5 | 33.64 .24 | 59.7 1.9 | 40.61 .07 | 49.9 0.4 | 52.96 .41 | 92.8 1.7 |
| 29.3 | 20.57 —.08 | 44.9 +0.6 | 33.38 —.28 | 61.4 —1.4 | 40.52 —.09 | 50.1 —0.1 | 52.52 —.46 | 94.4 +1.3 |
| June 8.3 | 20.48 .09 | 44.3 0.6 | 33.08 .31 | 62.6 1.0 | 40.43 .10 | 50.2 +0.1 | 52.04 .48 | 95.4 0.7 |
| 18.3 | 20.39 .09 | 43.7 0.6 | 32.76 .33 | 63.3 —0.5 | 40.33 .11 | 50.0 0.3 | 51.55 .50 | 95.9 +0.2 |
| 28.2 | 20.29 .09 | 43.1 0.6 | 32.42 .34 | 63.6 0.0 | 40.21 .11 | 49.6 0.5 | 51.04 .50 | 95.8 —0.3 |
| July 8.2 | 20.20 .09 | 42.5 0.6 | 32.07 .35 | 63.3 +0.5 | 40.10 .12 | 49.0 0.7 | 50.55 .49 | 95.2 0.8 |
| 18.2 | 20.11 —.09 | 42.0 +0.5 | 31.73 —.34 | 62.6 +1.0 | 39.98 —.12 | 48.2 +0.9 | 50.07 —.46 | 94.2 —1.3 |
| 28.2 | 20.02 .08 | 41.4 0.5 | 31.40 .29 | 61.4 1.4 | 39.87 .11 | 47.3 1.0 | 49.62 .42 | 92.6 1.8 |
| Aug. 7.1 | 19.94 .07 | 41.0 0.4 | 31.09 .29 | 59.8 1.8 | 39.77 .10 | 46.2 1.1 | 49.23 .37 | 90.5 2.3 |
| 17.1 | 19.88 .05 | 40.7 0.3 | 30.82 .24 | 57.8 2.1 | 39.68 .08 | 45.1 1.2 | 48.88 .31 | 88.0 2.7 |
| 27.1 | 19.84 .03 | 40.5 +0.1 | 30.61 .19 | 55.5 2.4 | 39.60 .06 | 43.9 1.2 | 48.60 .25 | 85.2 3.0 |
| Sept. 6.0 | 19.82 —.01 | 40.5 0.0 | 30.45 —.12 | 53.0 +2.6 | 39.56 —.03 | 42.7 +1.1 | 48.39 —.17 | 82.0 —3.3 |
| 16.0 | 19.83 +.02 | 40.6 —0.2 | 30.37 —.04 | 50.4 2.7 | 39.55 .00 | 41.6 1.0 | 48.26 —.06 | 78.6 3.5 |
| 26.0 | 19.87 .06 | 41.0 0.5 | 30.36 +.04 | 47.7 2.6 | 39.57 +.04 | 40.7 0.8 | 48.23 +.01 | 75.0 3.7 |
| Oct. 6.0 | 19.95 .10 | 41.6 0.7 | 30.45 .13 | 45.1 2.5 | 39.64 .05 | 39.9 0.6 | 48.29 .11 | 71.2 3.8 |
| 15.9 | 20.07 .14 | 42.5 1.0 | 30.63 .22 | 42.7 2.2 | 39.75 .13 | 39.4 +0.3 | 48.45 .21 | 67.4 3.8 |
| 25.9 | 20.23 +.18 | 43.6 —1.3 | 30.90 +.31 | 40.6 +1.9 | 39.91 +.18 | 39.2 0.0 | 48.72 +.22 | 63.6 —3.7 |
| Nov. 4.9 | 20.44 .22 | 45.0 1.5 | 31.26 .29 | 38.9 1.5 | 40.11 .23 | 39.4 —0.3 | 49.09 .42 | 59.9 3.6 |
| 14.9 | 20.68 .26 | 46.7 1.7 | 31.69 .47 | 37.7 1.0 | 40.37 .27 | 39.9 0.7 | 49.57 .52 | 56.4 3.3 |
| 24.8 | 20.96 .30 | 48.6 1.9 | 32.19 .52 | 37.0 +0.4 | 40.66 .31 | 40.8 1.1 | 50.14 .61 | 53.3 3.0 |
| Dec. 4.8 | 21.27 .32 | 50.6 2.1 | 32.74 .57 | 36.9 —0.2 | 40.98 .28 | 42.1 1.4 | 50.79 .68 | 50.5 2.5 |
| 14.8 | 21.60 +.33 | 52.8 —2.2 | 33.32 +.59 | 37.4 —0.8 | 41.32 +.35 | 43.7 —1.7 | 51.51 +.74 | 48.2 —2.0 |
| 24.7 | 21.94 .34 | 55.0 2.2 | 33.92 .59 | 38.5 1.4 | 41.68 .36 | 45.6 2.0 | 52.27 .77 | 46.4 1.4 |
| 34.7 | 22.28 +.33 | 57.2 —2.2 | 34.51 +.57 | 40.1 —1.9 | 42.04 +.35 | 47.7 —2.2 | 53.05 +.79 | 45.3 —0.8 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | 32° Camelop. (H.) | | α Can. Venaticorum. | | θ Virginis. | | α Virginis. (Spica.) | |
|------------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|-----------------------------------|-----------------------|------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination South. |
| | ^h ^m 12 48 | +83° 59' | ^h ^m 12 50 | +38° 53' | ^h ^m 13 4 | — 4° 57' | ^h ^m 13 19 | —10° 35' |
| (Dec.30.7) | ^s 20.39+2.23 | 64.5 —1.0 | ^s 54.88 +.39 | 77.3 —1.9 | ^s 17.18 +.34 | 19.4 —2.2 | ^s 25.73 +.34 | 24.7 —2.1 |
| Jan. 9.7 | 22.64 2.25 | 63.9 —0.3 | 55.27 .39 | 75.6 1.5 | 17.52 .33 | 21.5 2.1 | 26.07 .34 | 26.8 2.1 |
| 19.7 | 24.88 2.19 | 63.9 +0.3 | 55.66 .38 | 74.4 1.0 | 17.85 .32 | 23.6 2.0 | 26.40 .33 | 28.9 2.1 |
| 29.7 | 27.03 2.06 | 64.5 1.0 | 56.03 .35 | 73.7 —0.4 | 18.16 .30 | 25.5 1.9 | 26.72 .31 | 30.9 2.0 |
| Feb. 8.6 | 29.00 1.85 | 65.8 1.6 | 56.37 .32 | 73.5 +0.1 | 18.44 .27 | 27.3 1.7 | 27.01 .28 | 32.8 1.9 |
| 18.6 | 30.73+1.58 | 67.7 +2.1 | 56.67 +.27 | 73.9 +0.6 | 18.69 +.24 | 28.9 —1.5 | 27.28 +.25 | 34.6 —1.7 |
| 28.6 | 32.16 1.26 | 70.0 2.5 | 56.92 .29 | 74.7 1.0 | 18.91 .20 | 30.2 1.9 | 27.51 .21 | 36.2 1.5 |
| Mar.10.6 | 33.25 .90 | 72.7 2.8 | 57.12 .18 | 76.0 1.4 | 19.09 .16 | 31.3 0.9 | 27.71 .18 | 37.5 1.9 |
| 20.5 | 33.96 .51 | 75.6 3.0 | 57.27 .13 | 77.6 1.7 | 19.24 .12 | 32.1 0.7 | 27.87 .14 | 38.6 1.0 |
| 30.5 | 34.28 +.12 | 78.7 3.1 | 57.37 .08 | 79.5 2.0 | 19.34 .09 | 32.7 0.5 | 27.99 .11 | 39.5 0.8 |
| Apr. 9.5 | 34.20 —.26 | 81.8 +3.0 | 57.42 +.03 | 81.5 +2.1 | 19.42 +.06 | 33.0 —0.2 | 28.08 +.08 | 40.2 —0.6 |
| 19.4 | 33.76 .62 | 84.8 2.8 | 57.43 —.01 | 83.7 2.1 | 19.46 +.03 | 33.2 0.0 | 28.14 .05 | 40.7 0.4 |
| 29.4 | 32.96 .25 | 87.5 2.6 | 57.40 .05 | 85.8 2.1 | 19.48 .00 | 33.1 +0.1 | 28.17 +.02 | 40.9 —0.2 |
| May 9.4 | 31.86 1.23 | 89.9 2.2 | 57.34 .08 | 87.8 2.0 | 19.47 —.02 | 33.0 0.2 | 28.18 —.01 | 41.1 0.0 |
| 19.4 | 30.50 1.47 | 92.0 1.8 | 57.24 .10 | 89.7 1.8 | 19.44 .04 | 32.7 0.3 | 28.16 .03 | 41.0 +0.1 |
| 29.3 | 28.92—1.70 | 93.5 +1.3 | 57.13 —.12 | 91.4 +1.5 | 19.39 —.06 | 32.3 +0.4 | 28.12 —.05 | 40.9 +0.2 |
| June 8.3 | 27.19 1.78 | 94.5 0.8 | 57.00 .14 | 92.7 1.2 | 19.33 .07 | 31.8 0.5 | 28.06 .07 | 40.6 0.3 |
| 18.3 | 25.35 1.86 | 95.0 +0.2 | 56.85 .15 | 93.7 0.8 | 19.25 .08 | 31.3 0.5 | 27.99 .08 | 40.3 0.4 |
| 28.3 | 23.46 1.89 | 94.9 —0.3 | 56.70 .16 | 94.4 0.5 | 19.16 .09 | 30.7 0.6 | 27.90 .09 | 39.8 0.5 |
| July 8.2 | 21.58 1.86 | 94.3 0.9 | 56.54 .16 | 94.7 +0.1 | 19.06 .10 | 30.2 0.6 | 27.81 .10 | 39.3 0.5 |
| 18.2 | 19.74—1.79 | 93.1 —1.4 | 56.38 —.16 | 94.6 —0.3 | 18.96 —.10 | 29.6 +0.6 | 27.70 —.11 | 38.8 +0.6 |
| 28.2 | 18.00 1.68 | 91.4 2.0 | 56.23 .15 | 94.1 0.6 | 18.85 .10 | 29.1 0.5 | 27.59 .11 | 38.2 0.6 |
| Aug. 7.1 | 16.38 1.53 | 89.3 2.4 | 56.08 .14 | 93.3 1.0 | 18.75 .10 | 28.6 0.5 | 27.48 .11 | 37.6 0.6 |
| 17.1 | 14.94 1.34 | 86.7 2.8 | 55.95 .12 | 92.0 1.4 | 18.65 .09 | 28.1 0.4 | 27.37 .10 | 37.0 0.6 |
| 27.1 | 13.71 1.12 | 83.7 3.1 | 55.84 .09 | 90.5 1.7 | 18.57 .07 | 27.7 0.3 | 27.28 .09 | 36.5 0.5 |
| Sept. 6.1 | 12.70— .87 | 80.4 —3.4 | 55.76 —.08 | 88.6 —2.1 | 18.50 —.05 | 27.5 +0.2 | 27.20 —.07 | 36.0 +0.4 |
| 16.0 | 11.96 .60 | 76.8 3.7 | 55.71 —.03 | 86.3 2.4 | 18.46 —.02 | 27.4 0.0 | 27.14 .04 | 35.6 0.3 |
| 26.0 | 11.50— .31 | 73.0 3.8 | 55.70 +.01 | 83.8 2.6 | 18.46 +.01 | 27.5 —0.2 | 27.12 —.01 | 35.4 +0.1 |
| Oct. 6.0 | 11.34 .00 | 69.1 3.9 | 55.73 .06 | 81.1 2.8 | 18.49 .05 | 27.8 0.4 | 27.14 +.04 | 35.4 —0.1 |
| 16.0 | 11.50+ .32 | 65.2 3.9 | 55.82 .11 | 78.1 3.0 | 18.56 .09 | 28.3 0.7 | 27.19 .08 | 35.6 0.3 |
| 25.9 | 11.99+ .65 | 61.3 —3.8 | 55.95 +.16 | 75.0 —3.1 | 18.68 +.14 | 29.2 —0.9 | 27.30 +.13 | 36.0 —0.6 |
| Nov. 4.9 | 12.81 .98 | 57.5 3.6 | 56.13 .21 | 71.9 3.2 | 18.84 .18 | 30.2 1.2 | 27.45 .17 | 36.7 0.9 |
| 14.9 | 13.94 1.29 | 54.0 3.3 | 56.37 .26 | 68.7 3.2 | 19.04 .22 | 31.6 1.5 | 27.65 .22 | 37.7 1.1 |
| 24.8 | 15.38 1.57 | 50.8 3.0 | 56.65 .31 | 65.5 3.0 | 19.29 .26 | 33.2 1.7 | 27.89 .26 | 39.0 1.4 |
| Dec. 4.8 | 17.08 1.82 | 48.0 2.5 | 56.98 .35 | 62.6 2.8 | 19.58 .29 | 35.0 1.9 | 28.17 .29 | 40.6 1.6 |
| 14.8 | 19.02+2.02 | 45.8 —2.0 | 57.35 +.38 | 59.8 —2.5 | 19.89 +.32 | 37.0 —2.0 | 28.48 +.32 | 42.3 —1.8 |
| 24.8 | 21.13 2.16 | 44.1 1.4 | 57.73 .39 | 57.4 2.2 | 20.22 .33 | 39.1 2.1 | 28.81 .34 | 44.3 2.0 |
| 34.7 | 23.34+2.23 | 43.0 —0.7 | 58.13 +.40 | 55.4 —1.8 | 20.56 +.34 | 41.2 —2.1 | 29.15 +.35 | 46.3 —2.1 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | ζ Virginis. | | η Ursæ Majoris. | | η Bootis. | | β Centauri. | |
|------------------------|------------------------------------|------------------------|------------------------------------|------------------------|------------------------------------|------------------------|------------------------------------|------------------------|
| | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination South. |
| | ^h ^m 13 29 | — ° ′ 0 2 | ^h ^m 13 43 | +49° 50′ | ^h ^m 13 49 | +18° 56′ | ^h ^m 13 56 | —59° 50′ |
| (Dec.30.8) | ^s 7.04 +.34 | ["] 14.7 -2.9 | ^s 13.57 +.44 | ["] 75.3 -2.2 | ^s 28.38 +.34 | ["] 36.5 -2.4 | ^s 5.35 +.57 | ["] 28.5 -0.5 |
| Jan. 9.8 | 7.37 .33 | 16.9 2.1 | 14.01 .44 | 73.3 1.8 | 28.72 .34 | 34.2 2.1 | 5.92 .57 | 29.3 1.0 |
| 19.7 | 7.70 .32 | 18.9 1.9 | 14.46 .44 | 71.7 1.9 | 29.06 .33 | 32.3 1.8 | 6.49 .56 | 30.6 1.5 |
| 29.7 | 8.02 .31 | 20.8 1.7 | 14.90 .43 | 70.8 -0.6 | 29.39 .32 | 30.7 1.4 | 7.04 .54 | 32.3 1.9 |
| Feb. 8.7 | 8.31 .28 | 22.4 1.5 | 15.32 .40 | 70.5 0.0 | 29.70 .30 | 29.4 1.0 | 7.57 .51 | 34.4 2.3 |
| 18.7 | 8.58 +.25 | 23.8 -1.3 | 15.70 +.36 | 70.8 +0.5 | 30.00 +.28 | 28.7 -0.5 | 8.06 +.46 | 36.8 -2.6 |
| 28.6 | 8.82 .22 | 24.9 1.0 | 16.05 .32 | 71.7 1.1 | 30.26 .25 | 28.3 -0.1 | 8.50 .41 | 39.6 2.8 |
| Mar. 10.6 | 9.02 .18 | 25.7 0.7 | 16.34 .27 | 73.2 1.6 | 30.46 .21 | 28.4 +0.2 | 8.89 .36 | 42.4 2.9 |
| 20.6 | 9.19 .15 | 26.3 0.4 | 16.58 .21 | 75.0 2.0 | 30.67 .17 | 28.9 0.6 | 9.22 .30 | 45.5 3.0 |
| 30.5 | 9.32 .12 | 26.5 -0.1 | 16.76 .15 | 77.2 2.3 | 30.83 .13 | 29.6 0.9 | 9.48 .24 | 48.5 3.1 |
| Apr. 9.5 | 9.42 +.08 | 26.5 +0.1 | 16.88 +.09 | 79.7 +2.5 | 30.94 +.10 | 30.7 +1.1 | 9.69 +.18 | 51.6 -3.0 |
| 19.5 | 9.48 .05 | 26.4 0.3 | 16.95 +.04 | 82.3 2.6 | 31.02 .07 | 32.0 1.3 | 9.84 .12 | 54.7 2.9 |
| 29.5 | 9.52 +.02 | 26.0 0.4 | 16.96 -0.1 | 84.9 2.6 | 31.07 .04 | 33.4 1.4 | 9.93 +.06 | 57.6 2.8 |
| May 9.4 | 9.53 .00 | 25.5 0.5 | 16.93 .06 | 87.5 2.5 | 31.09 +.01 | 34.9 1.5 | 9.96 .00 | 60.3 2.6 |
| 19.4 | 9.52 -0.2 | 25.0 0.6 | 16.85 .10 | 89.9 2.3 | 31.09 -0.2 | 36.4 1.5 | 9.94 -0.5 | 62.8 2.4 |
| 29.4 | 9.49 -0.4 | 24.3 +0.6 | 16.73 -1.3 | 92.1 +2.0 | 31.05 -0.4 | 37.8 +1.4 | 9.86 -1.1 | 65.1 -2.1 |
| June 8.3 | 9.44 .06 | 23.7 0.7 | 16.58 .16 | 94.0 1.7 | 31.00 .06 | 39.1 1.3 | 9.72 .16 | 67.1 1.8 |
| 18.3 | 9.37 .08 | 23.0 0.6 | 16.40 .19 | 95.5 1.3 | 30.92 .08 | 40.3 1.1 | 9.54 .20 | 68.7 1.4 |
| 28.3 | 9.28 .09 | 22.4 0.6 | 16.20 .21 | 96.6 0.9 | 30.83 .10 | 41.3 0.9 | 9.31 .24 | 69.9 1.0 |
| July 8.3 | 9.19 .10 | 21.8 0.6 | 15.98 .22 | 97.3 +0.4 | 30.72 .11 | 42.1 0.6 | 9.05 .28 | 70.7 0.6 |
| 18.2 | 9.08 -1.1 | 21.2 +0.5 | 15.75 -0.2 | 97.6 0.0 | 30.61 -1.2 | 42.6 +0.4 | 8.76 -0.30 | 71.0 -0.1 |
| 28.2 | 8.97 .11 | 20.8 0.4 | 15.51 .23 | 97.3 -0.5 | 30.48 .13 | 43.0 +0.2 | 8.45 .31 | 70.9 +0.3 |
| Aug. 7.2 | 8.86 .11 | 20.4 0.3 | 15.28 .22 | 96.6 0.9 | 30.35 .13 | 43.0 -0.1 | 8.13 .32 | 70.4 0.7 |
| 17.2 | 8.75 .10 | 20.1 0.2 | 15.06 .22 | 95.4 1.4 | 30.22 .12 | 42.8 0.4 | 7.82 .30 | 69.4 1.1 |
| 27.1 | 8.66 .09 | 20.0 +0.1 | 14.85 .20 | 93.8 1.8 | 30.10 .11 | 42.3 0.7 | 7.52 .28 | 68.1 1.5 |
| Sept. 6.1 | 8.57 -0.7 | 20.0 -0.1 | 14.67 -1.7 | 91.8 -2.2 | 29.99 -1.0 | 41.5 -0.9 | 7.26 -0.24 | 66.4 +1.8 |
| 16.1 | 8.51 .05 | 20.1 0.3 | 14.52 .13 | 89.4 2.6 | 29.91 .07 | 40.4 1.2 | 7.04 .19 | 64.4 2.1 |
| 26.0 | 8.48 -0.2 | 20.5 0.5 | 14.41 .09 | 86.7 2.9 | 29.85 -0.4 | 39.0 1.5 | 6.88 .12 | 62.1 2.3 |
| Oct. 6.0 | 8.49 +0.1 | 21.1 0.7 | 14.34 -0.4 | 83.7 3.2 | 29.82 .00 | 37.4 1.8 | 6.80 -0.4 | 59.8 2.4 |
| 16.0 | 8.53 .06 | 21.9 0.9 | 14.34 +0.2 | 80.4 3.4 | 29.84 +0.4 | 35.5 2.0 | 6.80 +0.5 | 57.4 2.4 |
| 26.0 | 8.62 +1.1 | 22.0 -1.2 | 14.39 +0.6 | 76.9 -3.5 | 29.90 +0.6 | 33.3 -2.3 | 6.88 +1.3 | 55.2 +2.3 |
| Nov. 4.9 | 8.76 .16 | 24.3 1.4 | 14.51 .15 | 73.3 3.6 | 30.01 .13 | 30.9 2.5 | 7.06 .22 | 53.0 2.0 |
| 14.9 | 8.94 .20 | 25.9 1.7 | 14.69 .21 | 69.6 3.6 | 30.17 .18 | 28.4 2.6 | 7.33 .31 | 51.2 1.7 |
| 24.9 | 9.16 .24 | 27.7 1.9 | 14.94 .27 | 66.1 3.5 | 30.38 .23 | 25.7 2.7 | 7.68 .39 | 49.8 1.3 |
| Dec. 4.8 | 9.43 .28 | 29.6 2.0 | 15.24 .32 | 62.6 3.3 | 30.63 .27 | 23.0 2.7 | 8.10 .46 | 48.7 0.8 |
| 14.8 | 9.73 +.31 | 31.8 -2.1 | 15.60 +.32 | 59.5 -3.0 | 30.92 +.30 | 20.3 -2.7 | 8.59 +.53 | 48.2 +0.3 |
| 24.8 | 10.05 .33 | 33.9 2.2 | 16.00 .40 | 56.6 2.6 | 31.23 .33 | 17.7 2.5 | 9.13 .55 | 48.1 -0.2 |
| 34.8 | 10.38 +.34 | 36.1 -2.1 | 16.43 +.44 | 54.3 -2.1 | 31.57 +.34 | 15.3 -2.3 | 9.69 +.56 | 48.6 -0.7 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Draconis. | | α Bootis. (Arcturus.) | | θ Bootis. | | ρ Bootis. | |
|------------------------|-----------------------|-----------------------|---------------------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 14 | ^m 1 | ^h 14 | ^m 10 | ^h 14 | ^m 21 | ^h 14 | ^m 27 |
| | | +64° 53' | | +19° 44' | | +52° 20' | | +30° 50' |
| (Dec.30.8) | ^s 24.94 | +56 | ^s 39.96 | +39 | ^s 27.74 | +42 | ^s 6.52 | +39 |
| Jan. 9.8 | 25.53 | .60 | 40.29 | .33 | 28.17 | .44 | 6.86 | .35 |
| 19.8 | 26.14 | .63 | 40.63 | .33 | 28.62 | .45 | 61.0 | 1.6 |
| 29.7 | 26.76 | .61 | 40.96 | .39 | 29.08 | .45 | 7.57 | .35 |
| Feb. 8.7 | 27.36 | .58 | 41.28 | .31 | 29.53 | .43 | 7.92 | .34 |
| | | 30.6 +0.2 | | 49.2 1.1 | | 59.0 -0.3 | | 45.9 0.9 |
| 18.7 | 27.92 | +53 | 41.58 | +39 | 29.95 | +40 | 8.25 | +32 |
| 28.7 | 28.43 | .47 | 41.85 | .36 | 30.34 | .36 | 8.55 | .29 |
| Mar. 10.6 | 28.87 | .40 | 42.09 | .23 | 30.68 | .39 | 8.82 | .25 |
| 20.6 | 29.23 | .32 | 42.30 | .19 | 30.98 | .27 | 9.06 | .22 |
| 30.6 | 29.50 | .23 | 42.47 | .15 | 31.21 | .21 | 9.25 | .18 |
| | | 31.1 +0.8 | | 48.3 -0.6 | | 59.0 +0.3 | | 45.3 -0.4 |
| Apr. 9.5 | 29.69 | +14 | 42.61 | +12 | 31.40 | +15 | 9.41 | +14 |
| 19.5 | 29.79 | +05 | 42.71 | .08 | 31.52 | .09 | 9.53 | .10 |
| 29.5 | 29.80 | -03 | 42.78 | .05 | 31.58 | +04 | 9.62 | .06 |
| May 9.5 | 29.73 | .11 | 42.81 | +02 | 31.59 | -01 | 9.66 | +03 |
| 19.4 | 29.58 | .18 | 42.82 | -01 | 31.55 | .06 | 9.68 | .00 |
| | | 50.4 2.8 | | 55.9 1.5 | | 77.9 2.6 | | 55.5 2.1 |
| 29.4 | 29.37 | -24 | 42.80 | -03 | 31.46 | -11 | 9.66 | -03 |
| June 8.4 | 29.09 | .30 | 42.76 | .05 | 31.32 | .15 | 9.60 | .06 |
| 18.4 | 28.77 | .34 | 42.69 | .07 | 31.15 | .19 | 9.53 | .09 |
| 28.3 | 28.41 | .38 | 42.60 | .09 | 30.95 | .22 | 9.43 | .11 |
| July 8.3 | 28.02 | .40 | 42.50 | .11 | 30.72 | .24 | 9.30 | .13 |
| | | 61.3 +0.5 | | 62.0 0.7 | | 87.1 0.8 | | 65.8 1.0 |
| 18.3 | 27.61 | -41 | 42.38 | -13 | 30.47 | -26 | 9.16 | -15 |
| 28.2 | 27.19 | .42 | 42.24 | .14 | 30.20 | .27 | 9.00 | .16 |
| Aug. 7.2 | 26.77 | .41 | 42.11 | .14 | 29.93 | .27 | 8.84 | .17 |
| 17.2 | 26.36 | .39 | 41.96 | .14 | 29.66 | .26 | 8.67 | .17 |
| 27.2 | 25.98 | .36 | 41.83 | .13 | 29.40 | .25 | 8.50 | .16 |
| | | 57.2 2.0 | | 62.4 0.6 | | 85.4 1.5 | | 66.2 0.8 |
| Sept. 6.1 | 25.64 | -32 | 41.70 | -11 | 29.15 | -23 | 8.35 | -15 |
| 16.1 | 25.33 | .27 | 41.60 | .09 | 28.93 | .20 | 8.21 | .13 |
| 26.1 | 25.09 | .21 | 41.52 | .06 | 28.75 | .16 | 8.10 | .10 |
| Oct. 6.1 | 24.91 | .14 | 41.47 | -03 | 28.62 | .11 | 8.02 | .08 |
| 16.0 | 24.81 | -06 | 41.46 | +01 | 28.54 | -05 | 7.98 | -01 |
| | | 42.2 3.7 | | 55.5 2.1 | | 72.7 3.3 | | 57.6 2.5 |
| 26.0 | 24.80 | +03 | 41.49 | +05 | 28.52 | +01 | 7.99 | +04 |
| Nov. 5.0 | 24.88 | .13 | 41.58 | .11 | 28.57 | .08 | 8.06 | .09 |
| 14.0 | 25.05 | .22 | 41.71 | .16 | 28.69 | .15 | 8.17 | .14 |
| 24.0 | 25.32 | .31 | 41.90 | .21 | 28.88 | .22 | 8.34 | .19 |
| Dec. 4.9 | 25.68 | .40 | 42.13 | .25 | 29.14 | .29 | 8.56 | .24 |
| | | 23.2 3.5 | | 42.7 2.8 | | 54.5 3.6 | | 42.7 3.1 |
| 14.9 | 26.13 | +48 | 42.40 | +28 | 29.45 | +34 | 8.82 | +26 |
| 24.8 | 26.64 | .54 | 42.70 | .31 | 29.83 | .39 | 9.13 | .31 |
| 34.8 | 27.20 | +57 | 43.02 | +33 | 30.24 | +43 | 9.46 | +33 |
| | | 14.6 -2.1 | | 34.6 -2.4 | | 45.1 -2.4 | | 33.9 -2.5 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | 5 Ursæ Minoris. | | α^3 Centauri. | | ϵ Bootis. | | α^3 Libræ. | |
|------------------------|------------------------------------|---------------------------|------------------------------------|--------------------------|------------------------------------|---------------------------|------------------------------------|---------------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination South. |
| | ^h ^m 14 27 | +76° 10' | ^h ^m 14 32 | —60° 22' | ^h ^m 14 40 | +27° 31' | ^h ^m 14 44 | —15° 35' |
| (Dec.30.8) | ^s 43.49 +.87 | ["] 35.8 —2.4 | ^s 10.12 +.55 | ["] 59.5 0.0 | ^s 12.10 +.38 | ["] 56.2 —2.6 | ^s 49.03 +.38 | ["] 12.1 —1.6 |
| Jan. 9.8 | 44.39 .94 | 33.6 1.9 | 10.67 .56 | 59.8 —0.5 | 12.43 .33 | 53.7 2.4 | 49.36 .33 | 13.7 1.7 |
| 19.8 | 45.36 .99 | 32.0 1.2 | 11.24 .56 | 60.6 1.0 | 12.77 .34 | 51.5 2.0 | 49.70 .34 | 15.4 1.7 |
| 29.7 | 46.37 1.00 | 31.1 —0.5 | 11.81 .55 | 61.8 1.4 | 13.12 .34 | 49.8 1.5 | 50.04 .33 | 17.1 1.7 |
| Feb. 8.7 | 47.37 .98 | 30.9 +0.1 | 12.36 .53 | 63.4 1.8 | 13.46 .33 | 48.4 1.0 | 50.36 .32 | 18.8 1.6 |
| 18.7 | 48.33 +.93 | 31.3 +0.7 | 12.88 +.50 | 65.4 —2.1 | 13.78 +.31 | 47.7 —0.5 | 50.68 +.30 | 20.4 —1.5 |
| 28.7 | 49.22 .84 | 32.4 1.4 | 13.37 .46 | 67.6 2.4 | 14.09 .29 | 47.4 0.0 | 50.97 .28 | 21.9 1.4 |
| Mar. 10.6 | 50.02 .73 | 34.1 1.9 | 13.80 .41 | 70.2 2.6 | 14.36 .26 | 47.6 +0.5 | 51.24 .25 | 23.2 1.2 |
| 20.6 | 50.69 .59 | 36.2 2.3 | 14.19 .36 | 72.9 2.7 | 14.60 .22 | 48.3 0.9 | 51.48 .22 | 24.4 1.0 |
| 30.6 | 51.21 .45 | 38.8 2.7 | 14.53 .30 | 75.7 2.8 | 14.80 .19 | 49.4 1.3 | 51.69 .19 | 25.4 0.9 |
| Apr. 9.6 | 51.58 +.29 | 41.7 +2.9 | 14.80 +.24 | 78.6 —2.9 | 14.97 +.15 | 50.9 +1.6 | 51.87 +.16 | 26.2 —0.7 |
| 19.5 | 51.79 +.13 | 44.7 3.0 | 15.02 .18 | 81.5 2.9 | 15.11 .11 | 52.6 1.8 | 52.02 .14 | 26.8 0.5 |
| 29.5 | 51.84 —.03 | 47.8 3.0 | 15.17 .12 | 84.4 2.8 | 15.20 .08 | 54.5 2.0 | 52.14 .11 | 27.2 0.4 |
| May 9.5 | 51.73 .18 | 50.9 2.9 | 15.27 +.06 | 87.1 2.7 | 15.27 .05 | 56.6 2.0 | 52.23 .08 | 27.6 0.2 |
| 19.4 | 51.48 .22 | 53.8 2.7 | 15.30 .00 | 89.7 2.5 | 15.30 +0.1 | 58.6 2.0 | 52.29 .05 | 27.8 —0.1 |
| 29.4 | 51.08 —.45 | 56.4 +2.5 | 15.27 —.06 | 92.1 —2.3 | 15.29 —.02 | 60.6 +1.9 | 52.32 +.02 | 27.8 0.0 |
| June 8.4 | 50.57 .56 | 58.6 2.1 | 15.19 .11 | 94.3 2.0 | 15.26 .05 | 62.4 1.8 | 52.33 —.01 | 27.8 +0.1 |
| 18.4 | 49.95 .66 | 60.5 1.6 | 15.04 .17 | 96.2 1.7 | 15.20 .07 | 64.1 1.6 | 52.31 .03 | 27.8 0.1 |
| 28.3 | 49.25 .73 | 61.9 1.1 | 14.84 .22 | 97.7 1.3 | 15.11 .10 | 65.6 1.3 | 52.26 .06 | 27.6 0.2 |
| July 8.3 | 48.48 .79 | 62.8 0.6 | 14.60 .26 | 98.8 0.9 | 15.00 .12 | 66.7 1.0 | 52.19 .08 | 27.4 0.2 |
| 18.3 | 47.66 —.83 | 63.2 +0.1 | 14.31 —.30 | 99.6 —0.5 | 14.87 —.14 | 67.6 +0.7 | 52.10 —.10 | 27.1 +0.3 |
| 28.3 | 46.82 .85 | 63.0 —0.4 | 14.00 .33 | 99.9 —0.1 | 14.73 .15 | 68.2 +0.4 | 51.98 .12 | 26.7 0.4 |
| Aug. 7.2 | 45.97 .84 | 62.3 0.9 | 13.66 .34 | 99.8 +0.3 | 14.57 .16 | 68.4 0.0 | 51.85 .13 | 26.3 0.4 |
| 17.2 | 45.13 .82 | 61.1 1.4 | 13.32 .34 | 99.2 0.7 | 14.40 .16 | 68.3 —0.3 | 51.71 .14 | 25.9 0.4 |
| 27.2 | 44.32 .78 | 59.4 1.9 | 12.98 .33 | 98.2 1.1 | 14.24 .16 | 67.8 0.6 | 51.57 .14 | 25.4 0.5 |
| Sept. 6.1 | 43.57 —.72 | 57.1 —2.4 | 12.66 —.30 | 96.8 +1.5 | 14.08 —.15 | 67.0 —1.0 | 51.44 —.13 | 25.0 +0.4 |
| 16.1 | 42.89 .63 | 54.5 2.8 | 12.38 .25 | 95.1 1.8 | 13.94 .13 | 65.8 1.3 | 51.32 .11 | 24.5 0.4 |
| 26.1 | 42.30 .53 | 51.5 3.2 | 12.15 .19 | 93.1 2.1 | 13.82 .10 | 64.2 1.7 | 51.22 .08 | 24.2 0.3 |
| Oct. 6.1 | 41.82 .41 | 48.2 3.5 | 12.00 .12 | 90.9 2.2 | 13.74 .07 | 62.4 2.0 | 51.16 —.05 | 23.9 +0.2 |
| 16.0 | 41.47 .26 | 44.5 3.7 | 11.92 —.04 | 88.6 2.3 | 13.69 —.02 | 60.2 2.3 | 51.13 .00 | 23.8 0.0 |
| 26.0 | 41.27 —.13 | 40.7 —3.8 | 11.92 +.05 | 86.3 +2.2 | 13.69 +.03 | 57.8 —2.6 | 51.15 +.05 | 23.8 —0.2 |
| Nov. 5.0 | 41.22 +.03 | 36.8 3.9 | 12.02 .15 | 84.1 2.1 | 13.74 .07 | 55.1 2.8 | 51.22 .09 | 24.1 0.4 |
| 15.0 | 41.33 .19 | 32.9 3.9 | 12.22 .24 | 82.1 1.9 | 13.84 .12 | 52.2 2.9 | 51.34 .14 | 24.6 0.6 |
| 24.9 | 41.60 .26 | 29.0 3.8 | 12.51 .33 | 80.3 1.6 | 13.99 .18 | 49.2 3.0 | 51.51 .19 | 25.3 0.8 |
| Dec. 4.9 | 42.04 .52 | 25.3 3.5 | 12.88 .41 | 78.9 1.2 | 14.19 .23 | 46.1 3.0 | 51.73 .24 | 26.3 1.1 |
| 14.9 | 42.63 +.66 | 21.9 —3.2 | 13.32 +.47 | 78.0 +0.7 | 14.44 +.27 | 43.0 —3.0 | 51.99 +.22 | 27.5 —1.3 |
| 24.8 | 43.36 .76 | 18.9 2.8 | 13.82 .52 | 77.5 +0.2 | 14.73 .30 | 40.1 2.8 | 52.28 .29 | 28.9 1.5 |
| 34.8 | 44.21 +.89 | 16.4 —2.2 | 14.36 +.55 | 77.4 —0.2 | 15.05 +.32 | 37.4 —2.5 | 52.60 +.33 | 30.4 —1.6 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | β Ursæ Minoris. | | β Bootis. | | β Libræ. | | μ Bootis. | |
|------------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. |
| | ^h ^m 14 50 | +74° 35' | ^h ^m 14 57 | +40° 48' | ^h ^m 15 11 | — 8° 58' | ^h ^m 15 20 | +37° 45' |
| (Dec. 30.8) | ^s 59.22 +.74 | " 49.8 -2.7 | ^s 48.77 +.33 | " 65.3 -2.9 | ^s 6.57 +.30 | " 45.8 -1.7 | ^s 20.60 +.31 | " 26.8 -3.0 |
| Jan. 9.8 | 60.00 .81 | 47.3 2.3 | 49.12 .36 | 62.6 2.5 | 6.88 .31 | 47.5 1.7 | 20.93 .33 | 24.0 2.6 |
| 19.8 | 60.85 .87 | 45.4 1.6 | 49.49 .37 | 60.3 2.0 | 7.21 .32 | 49.2 1.7 | 21.28 .35 | 21.5 2.2 |
| 29.8 | 61.74 .90 | 44.1 0.9 | 49.87 .38 | 58.5 1.5 | 7.53 .32 | 50.9 1.6 | 21.64 .36 | 19.5 1.7 |
| Feb. 8.7 | 62.65 .90 | 43.6 -0.2 | 50.25 .37 | 57.2 0.9 | 7.86 .32 | 52.5 1.5 | 22.00 .36 | 18.1 1.2 |
| 18.7 | 63.54 +.86 | 43.7 +0.4 | 50.62 +.36 | 56.6 -0.3 | 8.17 +.30 | 53.9 -1.3 | 22.36 +.35 | 17.2 -0.6 |
| 28.7 | 64.37 .80 | 44.5 1.0 | 50.96 .33 | 56.6 +0.3 | 8.47 .98 | 55.2 1.1 | 22.70 .33 | 16.9 0.0 |
| Mar. 10.7 | 65.14 .71 | 45.8 1.6 | 51.28 .30 | 57.1 0.8 | 8.74 .96 | 56.2 0.9 | 23.02 .30 | 17.2 +0.6 |
| 20.6 | 65.80 .61 | 47.8 2.1 | 51.57 .96 | 58.2 1.3 | 8.99 .24 | 57.0 0.7 | 23.32 .27 | 18.0 1.1 |
| 30.6 | 66.34 .48 | 50.2 2.5 | 51.81 .22 | 59.8 1.7 | 9.22 .21 | 57.6 0.5 | 23.57 .24 | 19.4 1.5 |
| Apr. 9.6 | 66.76 +.34 | 52.9 +2.8 | 52.01 +.18 | 61.7 +2.1 | 9.42 +.18 | 58.0 -0.3 | 23.79 +.20 | 21.1 +1.9 |
| 19.5 | 67.03 .90 | 55.9 3.0 | 52.17 .13 | 64.0 2.3 | 9.59 .16 | 58.1 -0.1 | 23.97 .16 | 23.2 2.2 |
| 29.5 | 67.16 +.06 | 59.0 3.1 | 52.29 .09 | 66.4 2.5 | 9.73 .13 | 58.1 +0.1 | 24.11 .12 | 25.6 2.4 |
| May 9.5 | 67.14 -0.08 | 62.1 3.0 | 52.36 .05 | 68.9 2.6 | 9.84 .10 | 58.0 0.2 | 24.21 .08 | 28.0 2.5 |
| 19.5 | 66.99 .22 | 65.0 2.9 | 52.39 +.01 | 71.5 2.5 | 9.93 .07 | 57.8 0.3 | 24.27 +.04 | 30.6 2.5 |
| 29.4 | 66.71 -0.34 | 67.8 +2.7 | 52.38 -0.03 | 74.0 +2.4 | 9.98 +.04 | 57.4 +0.3 | 24.29 .00 | 33.1 +2.4 |
| June 8.4 | 66.31 .45 | 70.3 2.3 | 52.33 .07 | 76.3 2.2 | 10.01 +.01 | 57.0 0.4 | 24.27 -0.04 | 35.5 2.3 |
| 18.4 | 65.81 .54 | 72.5 1.9 | 52.24 .10 | 78.4 1.9 | 10.01 -0.02 | 56.6 0.4 | 24.22 .07 | 37.6 2.1 |
| 28.4 | 65.22 .02 | 74.2 1.5 | 52.13 .13 | 80.2 1.6 | 9.98 .04 | 56.2 0.4 | 24.12 .11 | 39.6 1.8 |
| July 8.3 | 64.56 .60 | 75.4 1.0 | 51.98 .16 | 81.6 1.3 | 9.92 .07 | 55.8 0.4 | 24.00 .14 | 41.2 1.4 |
| 18.3 | 63.85 -0.73 | 76.1 +0.5 | 51.81 -0.18 | 82.7 +0.9 | 9.84 -0.09 | 55.4 0.4 | 23.85 -0.16 | 42.5 +1.1 |
| 28.3 | 63.09 .76 | 76.3 0.0 | 51.62 .90 | 83.4 +0.4 | 9.73 .11 | 55.0 0.4 | 23.67 .18 | 43.4 0.7 |
| Aug. 7.3 | 62.32 .78 | 76.0 -0.6 | 51.41 .21 | 83.6 0.0 | 9.61 .13 | 54.6 0.4 | 23.48 .20 | 43.9 +0.3 |
| 17.2 | 61.54 .77 | 75.1 1.1 | 51.19 .22 | 83.4 -0.4 | 9.47 .14 | 54.2 0.3 | 23.27 .21 | 44.0 -0.1 |
| 27.2 | 60.78 .74 | 73.7 1.6 | 50.97 .21 | 82.6 0.8 | 9.33 .14 | 53.9 0.3 | 23.06 .21 | 43.6 0.6 |
| Sept. 6.2 | 60.05 -0.70 | 71.8 -2.1 | 50.76 -0.20 | 81.7 -1.2 | 9.19 -0.13 | 53.7 +0.2 | 22.84 -0.20 | 42.8 -1.0 |
| 16.1 | 59.38 .63 | 69.5 2.5 | 50.57 .18 | 80.2 1.7 | 9.06 .12 | 53.5 +0.1 | 22.64 .19 | 41.6 1.4 |
| 26.1 | 58.78 .55 | 66.8 2.9 | 50.40 .15 | 78.3 2.1 | 8.94 .10 | 53.5 0.0 | 22.46 .17 | 40.0 1.8 |
| Oct. 6.1 | 58.27 .45 | 63.6 3.3 | 50.26 .12 | 76.0 2.5 | 8.86 .07 | 53.5 -0.1 | 22.31 .13 | 38.0 2.2 |
| 16.1 | 57.88 .33 | 60.2 3.6 | 50.16 .07 | 73.4 2.8 | 8.81 -0.03 | 53.8 0.3 | 22.20 .09 | 35.6 2.5 |
| 26.0 | 57.60 -0.20 | 56.5 -3.8 | 50.12 -0.02 | 70.4 -3.1 | 8.80 +.02 | 54.2 -0.5 | 22.13 -0.04 | 32.9 -2.8 |
| Nov. 5.0 | 57.47 -0.06 | 52.6 3.9 | 50.13 +0.04 | 67.2 3.3 | 8.84 .06 | 54.8 0.7 | 22.12 +0.01 | 29.9 3.1 |
| 15.0 | 57.49 +0.09 | 48.7 3.9 | 50.20 .10 | 63.8 3.4 | 8.93 .11 | 55.6 0.9 | 22.16 .07 | 26.7 3.3 |
| 24.9 | 57.65 .94 | 44.8 3.8 | 50.33 .16 | 60.4 3.5 | 9.07 .16 | 56.7 1.1 | 22.26 .13 | 23.3 3.4 |
| Dec. 4.9 | 57.97 .39 | 41.0 3.7 | 50.52 .22 | 56.8 3.4 | 9.26 .21 | 58.0 1.3 | 22.42 .16 | 19.9 3.4 |
| 14.9 | 58.44 +.53 | 37.4 -3.4 | 50.76 +.27 | 53.4 -3.3 | 9.49 +.25 | 59.4 -1.5 | 22.63 +.24 | 16.5 -3.3 |
| 24.9 | 59.03 .65 | 34.2 3.0 | 51.06 .31 | 50.2 3.1 | 9.76 .28 | 61.0 1.6 | 22.89 .28 | 13.2 3.1 |
| 34.8 | 59.74 +.76 | 31.4 -2.5 | 51.39 +.34 | 47.2 -2.8 | 10.06 +.30 | 62.7 -1.7 | 23.20 +.22 | 10.2 -2.9 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | γ^3 Ursæ Minoris. | | α Coronæ Borealis. | | α Serpentis. | | ϵ Serpentis. | |
|------------------------|---------------------------------------|--|---------------------------------------|---------------------------------------|---------------------------------------|--|---------------------------------------|--|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 15 ^m 20 | [°] +72 ['] 12 | ^h 15 ^m 30 | [°] +27 ['] 4 | ^h 15 ^m 38 | [°] + 6 ['] 45 | ^h 15 ^m 45 | [°] + 4 ['] 48 |
| (Dec.30.9) | ^s 51.68 +.50 | 66.0 -3.0 | ^s 2.58 +.20 | 48.5 -2.0 | ^s 52.04 +.27 | 66.5 -2.2 | ^s 21.01 +.27 | 21.6 -2.1 |
| Jan. 9.8 | 52.31 .66 | 63.2 2.5 | 2.88 .31 | 45.7 2.6 | 52.32 .29 | 64.3 2.1 | 21.30 .29 | 19.5 2.0 |
| 19.8 | 53.01 .73 | 60.9 2.0 | 3.20 .32 | 43.3 2.2 | 52.62 .31 | 62.2 2.0 | 21.60 .30 | 17.4 1.9 |
| 29.8 | 53.77 .77 | 59.2 1.4 | 3.54 .33 | 41.3 1.8 | 52.94 .31 | 60.4 1.7 | 21.91 .31 | 15.6 1.7 |
| Feb. 8.8 | 54.56 .79 | 58.2 -0.7 | 3.87 .33 | 39.7 1.3 | 53.25 .31 | 58.7 1.4 | 22.22 .31 | 14.0 1.4 |
| 18.7 | 55.35 +.77 | 57.8 0.0 | 4.20 +.32 | 38.6 -0.8 | 53.56 +.30 | 57.4 -1.1 | 22.53 +.30 | 12.7 -1.1 |
| 28.7 | 56.11 .73 | 58.2 +0.7 | 4.52 .31 | 38.0 -0.3 | 53.86 .29 | 56.5 0.8 | 22.83 .29 | 11.8 0.8 |
| Mar.10.7 | 56.82 .67 | 59.2 1.3 | 4.82 .29 | 38.0 +0.2 | 54.15 .27 | 55.9 -0.4 | 23.12 .28 | 11.1 0.4 |
| 20.7 | 57.46 .60 | 60.8 1.8 | 5.10 .26 | 38.4 0.7 | 54.41 .25 | 55.7 0.0 | 23.38 .26 | 10.9 -0.1 |
| 30.6 | 58.01 .50 | 62.9 2.3 | 5.34 .23 | 39.3 1.1 | 54.65 .23 | 55.8 +0.3 | 23.63 .23 | 10.9 +0.2 |
| Apr. 9.6 | 58.45 +.39 | 65.4 +2.7 | 5.56 +.20 | 40.6 +1.5 | 54.86 +.20 | 56.3 +0.6 | 23.85 +.20 | 11.3 +0.5 |
| 19.6 | 58.78 .27 | 68.2 2.9 | 5.74 .17 | 42.3 1.8 | 55.05 .17 | 57.0 0.8 | 24.04 .18 | 11.9 0.7 |
| 29.5 | 58.98 .15 | 71.3 3.1 | 5.89 .13 | 44.2 2.0 | 55.21 .15 | 57.9 1.0 | 24.21 .15 | 12.8 0.9 |
| May 9.5 | 59.07 +0.3 | 74.4 3.1 | 6.00 .10 | 46.3 2.1 | 55.34 .12 | 59.0 1.1 | 24.35 .12 | 13.7 1.1 |
| 19.5 | 59.04 -0.0 | 77.5 3.0 | 6.08 .06 | 48.4 2.2 | 55.44 .09 | 60.2 1.2 | 24.46 .09 | 14.8 1.1 |
| 29.5 | 58.88 -0.20 | 80.5 +2.9 | 6.13 +0.3 | 50.6 +2.1 | 55.52 +0.6 | 61.5 +1.2 | 24.54 +0.6 | 16.0 +1.2 |
| June 8.4 | 58.62 .31 | 83.2 2.6 | 6.14 .00 | 52.7 2.0 | 55.56 +0.3 | 62.7 1.2 | 24.58 +0.3 | 17.2 1.2 |
| 18.4 | 58.26 .40 | 85.7 2.3 | 6.12 -0.4 | 54.6 1.9 | 55.57 .00 | 64.0 1.2 | 24.60 .00 | 18.3 1.1 |
| 28.4 | 57.82 .49 | 87.7 1.9 | 6.06 .07 | 56.4 1.7 | 55.55 -0.3 | 65.1 1.1 | 24.59 -0.3 | 19.4 1.0 |
| July 8.4 | 57.29 .56 | 89.4 1.4 | 5.98 .10 | 57.9 1.4 | 55.50 .06 | 66.1 1.0 | 24.55 .06 | 20.4 0.9 |
| 18.3 | 56.70 -0.61 | 90.5 +0.9 | 5.86 -0.13 | 59.2 +1.1 | 55.42 -0.09 | 67.0 +0.8 | 24.47 -0.09 | 21.2 +0.8 |
| 28.3 | 56.06 .65 | 91.2 +0.4 | 5.72 .15 | 60.1 0.8 | 55.32 .11 | 67.7 0.6 | 24.37 .11 | 22.0 0.6 |
| Aug. 7.3 | 55.39 .68 | 91.3 -0.1 | 5.56 .16 | 60.7 0.4 | 55.20 .13 | 68.3 0.4 | 24.25 .13 | 22.5 0.5 |
| 17.2 | 54.70 .69 | 91.0 0.6 | 5.39 .17 | 61.0 +0.1 | 55.06 .15 | 68.6 0.3 | 24.12 .14 | 22.9 0.3 |
| 27.2 | 54.01 .68 | 90.0 1.1 | 5.21 .18 | 60.8 -0.3 | 54.91 .15 | 68.8 +0.1 | 23.97 .15 | 23.1 +0.1 |
| Sept. 6.2 | 53.33 -0.66 | 88.6 -1.6 | 5.03 -0.18 | 60.4 -0.7 | 54.75 -0.15 | 68.8 -0.1 | 23.81 -0.15 | 23.1 -0.1 |
| 16.2 | 52.70 .61 | 86.7 2.1 | 4.86 .17 | 59.5 1.0 | 54.61 .14 | 68.5 0.3 | 23.66 .14 | 22.9 0.3 |
| 26.1 | 52.11 .55 | 84.3 2.6 | 4.70 .15 | 58.3 1.4 | 54.47 .12 | 68.0 0.6 | 23.53 .12 | 22.5 0.5 |
| Oct. 6.1 | 51.59 .47 | 81.5 3.0 | 4.57 .12 | 56.7 1.7 | 54.36 .10 | 67.3 0.9 | 23.41 .10 | 21.9 0.7 |
| 16.1 | 51.16 .37 | 78.4 3.3 | 4.47 .08 | 54.8 2.1 | 54.28 .06 | 66.3 1.1 | 23.33 .06 | 21.0 1.0 |
| 26.1 | 50.84 -0.27 | 74.9 -3.6 | 4.42 -0.03 | 52.6 -2.4 | 54.24 -0.03 | 65.1 -1.3 | 23.29 -0.03 | 19.9 -1.2 |
| Nov. 5.0 | 50.63 .15 | 71.2 3.8 | 4.41 +0.03 | 50.0 2.6 | 54.25 +0.03 | 63.6 1.6 | 23.28 +0.02 | 18.5 1.5 |
| 15.0 | 50.55 -0.02 | 67.4 3.9 | 4.45 .07 | 47.3 2.8 | 54.30 .08 | 61.9 1.8 | 23.33 .07 | 17.0 1.7 |
| 25.0 | 50.60 +0.12 | 63.4 3.9 | 4.55 .12 | 44.3 3.0 | 54.40 .13 | 60.0 2.0 | 23.43 .12 | 15.2 1.9 |
| Dec. 4.9 | 50.79 .26 | 59.6 3.8 | 4.70 .17 | 41.3 3.1 | 54.55 .17 | 57.9 2.1 | 23.58 .17 | 13.2 2.0 |
| 14.9 | 51.12 +.30 | 55.8 -3.6 | 4.90 +.22 | 38.2 -3.0 | 54.75 +.22 | 55.7 -2.2 | 23.77 +.21 | 11.2 -2.1 |
| 24.9 | 51.56 .51 | 52.4 3.3 | 5.14 .26 | 35.2 2.9 | 54.99 .25 | 53.5 2.2 | 24.00 .25 | 9.0 2.2 |
| 34.9 | 52.13 +.61 | 49.3 -2.8 | 5.42 +.30 | 32.3 -2.2 | 55.26 +.26 | 51.2 -2.2 | 24.27 +.26 | 6.9 -2.1 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | ζ Ursæ Minoris. | | ε Coronæ Borealis. | | δ Scorpil. | | β ¹ Scorpil. | |
|------------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination South. |
| | ^h ^m 15 47 | +78° 7' | ^h ^m 15 53 | +27° 11' | ^h ^m 15 53 | -22° 18' | ^h ^m 15 59 | -19° 30' |
| (Dec.30.9) | ^s 53.89+ .70 | 34.2 -3.1 | ^s 2.65 +.98 | 31.8 -2.9 | ^s 51.03 +.39 | 34.4 -0.9 | ^s 3.70 +.38 | 19.8 -1.0 |
| Jan. 9.9 | 54.66 .84 | 31.3 2.7 | 2.93 .29 | 29.0 2.7 | 51.34 .31 | 35.4 1.0 | 4.00 .31 | 20.8 1.1 |
| 19.8 | 55.57 .96 | 28.8 2.2 | 3.24 .31 | 26.4 2.3 | 51.66 .33 | 36.4 1.1 | 4.32 .32 | 22.0 1.2 |
| 29.8 | 56.59 1.05 | 26.9 1.6 | 3.56 .33 | 24.3 1.9 | 52.00 .34 | 37.6 1.2 | 4.65 .33 | 23.2 1.2 |
| Feb. 8.8 | 57.68 1.10 | 25.6 0.9 | 3.89 .33 | 22.6 1.5 | 52.34 .34 | 38.8 1.2 | 4.99 .33 | 24.5 1.2 |
| 18.7 | 58.80+1.12 | 25.0 -0.3 | 4.22 +.32 | 21.3 -1.0 | 52.68 +.33 | 40.1 -1.2 | 5.32 +.33 | 25.7 -1.2 |
| 28.7 | 59.91 1.08 | 25.0 +0.4 | 4.54 .31 | 20.7 -0.4 | 53.01 .32 | 41.3 1.1 | 5.64 .32 | 26.8 1.1 |
| Mar. 10.7 | 60.97 1.02 | 25.8 -1.0 | 4.85 .29 | 20.5 +0.1 | 53.32 .30 | 42.4 1.1 | 5.95 .30 | 27.8 1.0 |
| 20.7 | 61.95 .92 | 27.1 1.6 | 5.14 .27 | 20.8 0.6 | 53.62 .28 | 43.4 1.0 | 6.25 .28 | 28.8 0.9 |
| 30.6 | 62.81 .79 | 29.0 2.1 | 5.40 .25 | 21.7 1.0 | 53.89 .26 | 44.3 0.9 | 6.52 .26 | 29.6 0.7 |
| Apr. 9.6 | 63.52+ .63 | 31.3 +2.5 | 5.63 +.22 | 22.9 +1.4 | 54.14 +.24 | 45.1 -0.8 | 6.77 +.24 | 30.2 -0.6 |
| 19.6 | 64.08 .48 | 34.0 2.8 | 5.83 .19 | 24.5 1.8 | 54.37 .21 | 45.8 0.7 | 6.99 .21 | 30.8 0.5 |
| 29.6 | 64.46 .29 | 37.0 3.0 | 6.00 .16 | 26.4 2.0 | 54.56 .18 | 46.4 0.6 | 7.19 .18 | 31.2 0.4 |
| May 9.5 | 64.65+ .11 | 40.1 3.1 | 6.14 .12 | 28.5 2.1 | 54.73 .15 | 47.0 0.5 | 7.36 .16 | 31.5 0.3 |
| 19.5 | 64.66- .09 | 43.3 3.1 | 6.25 .08 | 30.7 2.2 | 54.87 .12 | 47.4 0.4 | 7.50 .13 | 31.8 0.2 |
| 29.5 | 64.49- .26 | 46.3 +3.0 | 6.31 +.05 | 33.0 +2.2 | 54.98 +.09 | 47.8 -0.3 | 7.61 +.09 | 32.0 -0.2 |
| June 8.4 | 64.15 .43 | 49.2 2.7 | 6.35 +.01 | 35.2 2.1 | 55.05 .06 | 48.1 0.3 | 7.69 .06 | 32.1 0.1 |
| 18.4 | 63.64 .58 | 51.8 2.4 | 6.34 -0.02 | 37.3 2.0 | 55.09 +.02 | 48.3 0.2 | 7.73 +.02 | 32.2 -0.1 |
| 28.4 | 62.99 .72 | 54.1 2.1 | 6.30 .05 | 39.2 1.8 | 55.09 -0.01 | 48.5 0.2 | 7.74 -0.01 | 32.3 0.0 |
| July 8.4 | 62.21 .83 | 56.0 1.6 | 6.23 .09 | 40.9 1.5 | 55.06 .05 | 48.7 -0.1 | 7.71 .04 | 32.3 0.0 |
| 18.3 | 61.32- .83 | 57.4 +1.2 | 6.13 -0.12 | 42.3 +1.2 | 55.00 -0.08 | 48.7 0.0 | 7.65 -0.08 | 32.2 +0.1 |
| 28.3 | 60.34 1.01 | 58.4 0.7 | 6.00 .14 | 43.4 0.9 | 54.90 .11 | 48.7 +0.1 | 7.56 .11 | 32.2 0.1 |
| Aug. 7.3 | 59.30 1.06 | 58.8 +0.2 | 5.84 .16 | 44.2 0.6 | 54.77 .13 | 48.6 0.1 | 7.44 .13 | 32.0 0.2 |
| 17.3 | 58.22 1.09 | 58.8 -0.3 | 5.67 .18 | 44.6 +0.3 | 54.63 .15 | 48.4 0.2 | 7.30 .15 | 31.8 0.2 |
| 27.2 | 57.12 1.09 | 58.2 0.8 | 5.48 .19 | 44.7 -0.1 | 54.47 .16 | 48.2 0.3 | 7.14 .16 | 31.6 0.3 |
| Sept. 6.2 | 56.03-1.07 | 57.1 -1.3 | 5.29 -0.19 | 44.4 -0.5 | 54.31 -0.16 | 47.8 +0.4 | 6.98 -0.16 | 31.3 +0.3 |
| 16.2 | 54.97 1.02 | 55.5 1.8 | 5.10 .18 | 43.7 0.9 | 54.15 .15 | 47.5 0.4 | 6.83 .15 | 31.0 0.3 |
| 26.1 | 53.98 .95 | 53.4 2.3 | 4.93 .16 | 42.6 1.2 | 54.00 .13 | 47.1 0.4 | 6.68 .13 | 30.7 0.3 |
| Oct. 6.1 | 53.08 .84 | 50.9 2.7 | 4.78 .13 | 41.2 1.6 | 53.88 .10 | 46.6 0.4 | 6.56 .11 | 30.4 0.3 |
| 16.1 | 52.20 .72 | 48.0 3.1 | 4.66 .10 | 39.4 1.9 | 53.70 .07 | 46.2 0.3 | 6.47 .07 | 30.1 0.2 |
| 26.1 | 51.65- .57 | 44.7 -3.4 | 4.58 -0.06 | 37.3 -2.3 | 53.75 -0.02 | 45.9 +0.2 | 6.42 -0.03 | 29.9 +0.1 |
| Nov. 5.0 | 51.16 .40 | 41.2 3.6 | 4.55 -0.01 | 34.9 2.6 | 53.75 +0.03 | 45.7 +0.1 | 6.41 +0.02 | 29.9 0.0 |
| 15.0 | 50.85 .21 | 37.5 3.8 | 4.56 +0.04 | 32.2 2.8 | 53.80 .08 | 45.6 0.0 | 6.46 .07 | 30.0 -0.2 |
| 25.0 | 50.74- .01 | 33.7 3.8 | 4.63 .10 | 29.3 2.9 | 53.91 .13 | 45.8 -0.2 | 6.56 .12 | 30.2 0.4 |
| Dec. 5.0 | 50.82+ .19 | 29.8 3.8 | 4.76 .15 | 26.3 3.0 | 54.07 .18 | 46.1 0.4 | 6.72 .18 | 30.7 0.6 |
| 14.9 | 51.11+ .38 | 26.1 -3.6 | 4.93 +.20 | 23.2 -3.0 | 54.28 +.23 | 46.6 -0.6 | 6.92 +.22 | 31.3 -0.7 |
| 24.9 | 51.59 .57 | 22.5 3.4 | 5.16 .24 | 20.2 3.0 | 54.54 .27 | 47.2 0.8 | 7.16 .26 | 32.2 0.9 |
| 34.9 | 52.26+ .75 | 19.3 -3.0 | 5.42 +.27 | 17.2 -2.8 | 54.83 +.31 | 48.1 -1.0 | 7.45 +.29 | 33.1 -1.1 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | Groombridge 2320. | | δ Ophiuchi. | | τ Herculis. | | γ Draconis. | |
|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 16 | ^m 5 | ^h 16 | ^m 8 | ^h 16 | ^m 16 | ^h 16 | ^m 22 |
| | | +68° 5' | | — 3° 24' | | +46° 34' | | +61° 45' |
| (Dec. 30.9) | ^s 58.56 | +40 | ^s 35.91 | +98 | ^s 25.76 | +98 | ^s 28.52 | +31 |
| Jan. 9.9 | 59.00 .48 | 36.4 3.0 | 36.18 .98 | 49.0 1.7 | 26.05 .33 | 14.1 —3.4 | 28.87 .38 | 29.5 —3.5 |
| 19.8 | 59.52 .55 | 33.6 2.5 | 36.47 .90 | 50.8 1.7 | 26.38 .35 | 10.9 3.0 | 29.28 .44 | 26.1 3.2 |
| 29.8 | 60.11 .60 | 31.4 2.0 | 36.78 .31 | 52.4 1.6 | 26.74 .37 | 8.0 2.6 | 29.74 .49 | 23.2 2.7 |
| Feb. 8.8 | 60.73 .63 | 29.7 1.3 | 37.09 .31 | 53.8 1.4 | 27.13 .38 | 5.6 2.1 | 30.25 .51 | 20.7 2.2 |
| | | | | | | 3.7 1.6 | | 18.8 1.6 |
| 18.8 | 61.38 +.64 | 28.8 —0.6 | 37.40 +.31 | 55.1 —1.1 | 27.52 +.39 | 2.4 —1.0 | 30.77 +.52 | 17.6 —0.9 |
| 28.7 | 62.03 .84 | 28.5 0.0 | 37.71 .30 | 56.1 0.9 | 27.91 .38 | 1.7 —0.3 | 31.29 .53 | 17.0 —0.3 |
| Mar. 10.7 | 62.66 .61 | 28.8 +0.7 | 38.00 .98 | 56.9 0.6 | 28.28 .37 | 1.7 +0.3 | 31.81 .50 | 17.1 +0.4 |
| 20.7 | 63.24 .56 | 29.9 1.3 | 38.28 .97 | 57.4 0.3 | 28.64 .34 | 2.3 0.9 | 32.30 .47 | 17.8 1.1 |
| 30.7 | 63.77 .50 | 31.5 1.9 | 38.54 .95 | 57.6 —0.1 | 28.97 .31 | 3.5 1.4 | 32.75 .49 | 19.2 1.7 |
| Apr. 9.6 | 64.23 +.42 | 33.6 +2.3 | 38.78 +.43 | 57.6 +0.2 | 29.27 +.38 | 5.2 +1.9 | 33.15 +.37 | 21.2 +2.2 |
| 19.6 | 64.61 .33 | 36.2 2.7 | 39.00 .90 | 57.3 0.4 | 29.53 .94 | 7.3 2.3 | 33.49 .31 | 23.5 2.6 |
| 29.6 | 64.90 .94 | 39.0 3.0 | 39.19 .18 | 56.8 0.5 | 29.74 .19 | 9.8 2.6 | 33.76 .94 | 26.3 2.9 |
| May 9.5 | 65.09 .14 | 42.1 3.1 | 39.36 .15 | 56.2 0.6 | 29.91 .14 | 12.6 2.8 | 33.97 .17 | 29.3 3.1 |
| 19.5 | 65.18 +.05 | 45.3 3.2 | 39.49 .12 | 55.5 0.7 | 30.03 .10 | 15.4 2.9 | 34.10 .09 | 32.4 3.1 |
| 29.5 | 65.18 —.05 | 48.4 +3.1 | 39.60 +.09 | 54.8 +0.8 | 30.10 +.05 | 18.4 +2.9 | 34.15 +.03 | 35.5 +3.1 |
| June 8.5 | 65.08 .14 | 51.5 2.9 | 39.67 .06 | 54.0 0.8 | 30.12 .00 | 21.2 2.8 | 34.13 —.02 | 38.6 3.0 |
| 18.4 | 64.89 .23 | 54.3 2.7 | 39.72 +.02 | 53.2 0.8 | 30.09 —.05 | 24.0 2.6 | 34.04 .13 | 41.6 2.8 |
| 28.4 | 64.62 .31 | 56.9 2.4 | 39.72 —.01 | 52.4 0.7 | 30.02 .10 | 26.5 2.4 | 33.87 .90 | 44.3 2.5 |
| July 8.4 | 64.27 .39 | 59.1 2.0 | 39.70 .04 | 51.7 0.7 | 29.90 .14 | 28.7 2.1 | 33.64 .96 | 46.7 2.2 |
| 18.4 | 63.85 —.45 | 60.8 +1.5 | 39.65 —.07 | 51.1 +0.6 | 29.74 —.18 | 30.6 +1.7 | 33.35 —.31 | 48.7 +1.8 |
| 28.3 | 63.37 .50 | 62.2 1.1 | 39.56 .10 | 50.5 0.5 | 29.54 .22 | 32.1 1.3 | 33.01 .36 | 50.3 1.3 |
| Aug. 7.3 | 62.85 .54 | 63.0 0.6 | 39.45 .12 | 50.0 0.4 | 29.30 .24 | 33.2 0.8 | 32.63 .40 | 51.4 0.9 |
| 17.3 | 62.29 .57 | 63.4 +0.1 | 39.32 .14 | 49.7 0.3 | 29.05 .26 | 33.8 +0.4 | 32.21 .43 | 52.0 +0.4 |
| 27.2 | 61.71 .58 | 63.2 —0.4 | 39.17 .15 | 49.4 0.2 | 28.77 .28 | 34.0 —0.1 | 31.77 .44 | 52.1 —0.1 |
| Sept. 6.2 | 61.13 —.58 | 62.5 —1.0 | 39.02 —.15 | 49.3 +0.1 | 28.49 —.28 | 33.6 —0.6 | 31.32 —.45 | 51.7 —0.7 |
| 16.2 | 60.55 .56 | 61.2 1.5 | 38.86 .15 | 49.3 —0.1 | 28.21 .27 | 32.8 1.0 | 30.87 .44 | 50.8 1.2 |
| 26.2 | 60.01 .52 | 59.5 2.0 | 38.72 .13 | 49.4 0.2 | 27.94 .26 | 31.6 1.5 | 30.44 .42 | 49.4 1.7 |
| Oct. 6.1 | 59.51 .47 | 57.3 2.4 | 38.59 .11 | 49.7 0.4 | 27.70 .23 | 29.8 2.0 | 30.04 .28 | 47.5 2.2 |
| 16.1 | 59.07 .40 | 54.7 2.8 | 38.50 .08 | 50.2 0.6 | 27.49 .19 | 27.6 2.4 | 29.69 .33 | 45.1 2.6 |
| 26.1 | 58.71 —.32 | 51.6 —3.2 | 38.44 —.04 | 50.8 —0.8 | 27.32 —.14 | 25.1 —2.8 | 29.39 —.26 | 42.3 —3.0 |
| Nov. 5.1 | 58.44 .22 | 48.3 3.5 | 38.42 +.01 | 51.7 1.0 | 27.21 .08 | 22.1 3.1 | 29.16 .18 | 39.2 3.3 |
| 15.0 | 58.26 .12 | 44.7 3.7 | 38.45 .06 | 52.7 1.1 | 27.16 —.02 | 18.9 3.3 | 29.02 .10 | 35.7 3.6 |
| 25.0 | 58.20 —.01 | 40.9 3.8 | 38.53 .11 | 54.0 1.3 | 27.16 +.04 | 15.4 3.5 | 28.96 —.01 | 32.0 3.8 |
| Dec. 5.0 | 58.25 +.11 | 37.0 3.9 | 38.66 .15 | 55.4 1.5 | 27.24 .11 | 11.8 3.6 | 28.99 +.06 | 28.2 3.6 |
| 14.9 | 58.42 +.22 | 33.1 —3.8 | 38.84 +.20 | 57.0 —1.6 | 27.38 +.17 | 8.2 —3.6 | 29.12 +.17 | 24.3 —3.8 |
| 24.9 | 58.70 .33 | 29.4 3.6 | 39.06 .24 | 58.6 1.7 | 27.59 .23 | 4.6 3.5 | 29.33 .26 | 20.6 3.6 |
| 34.9 | 59.08 +.43 | 26.0 —3.3 | 39.31 +.27 | 60.4 —1.8 | 27.85 +.28 | 1.2 —3.3 | 29.63 +.34 | 17.0 —3.4 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Scorpii. (Antares.) | | β Herculis. | | Λ Draconis. | | ζ Ophiuchi. | |
|------------------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|
| | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination South. |
| | ^h ^m 16 22 | [°] ['] -26 11 | ^h ^m 16 25 | [°] ['] +21 43 | ^h ^m 16 28 | [°] ['] +68 59 | ^h ^m 16 31 | [°] ['] -10 20 |
| (Dec. 30.9) | ^s 40.98 +.36 | ["] 18.2 -0.5 | ^s 30.02 +.34 | ["] 34.0 -2.8 | ^s 9.02 +.36 | ["] 63.4 -3.5 | ^s 7.16 +.25 | ["] 44.2 -1.3 |
| Jan. 9.9 | 41.27 .31 | 18.8 0.7 | 30.28 .36 | 31.3 2.6 | 9.42 .45 | 60.0 3.2 | 7.42 .27 | 45.5 1.3 |
| 19.9 | 41.59 .33 | 19.5 0.8 | 30.55 .39 | 28.9 2.3 | 9.91 .53 | 57.0 2.7 | 7.71 .29 | 46.9 1.3 |
| 29.8 | 41.93 .34 | 20.4 0.9 | 30.85 .31 | 26.7 2.0 | 10.48 .59 | 54.6 2.2 | 8.02 .31 | 48.2 1.3 |
| Feb. 8.8 | 42.28 .35 | 21.3 0.9 | 31.17 .32 | 24.8 1.6 | 11.10 .64 | 52.7 1.5 | 8.33 .31 | 49.5 1.2 |
| 18.8 | 42.62 +.34 | 22.3 -1.0 | 31.48 +.32 | 23.5 -1.1 | 11.76 +.66 | 51.4 -0.9 | 8.64 +.31 | 50.6 -1.0 |
| 28.7 | 42.96 .34 | 23.2 1.0 | 31.80 .31 | 22.6 0.7 | 12.43 .66 | 50.8 -0.2 | 8.96 .31 | 51.5 0.8 |
| Mar. 10.7 | 43.30 .33 | 24.2 0.9 | 32.10 .30 | 22.2 -0.2 | 13.08 .64 | 50.9 +0.4 | 9.26 .30 | 52.3 0.7 |
| 20.7 | 43.62 .31 | 25.1 0.9 | 32.40 .28 | 22.2 +0.3 | 13.71 .60 | 51.7 1.1 | 9.56 .29 | 52.9 0.5 |
| 30.7 | 43.92 .29 | 25.9 0.8 | 32.67 .26 | 22.8 0.8 | 14.29 .54 | 53.1 1.7 | 9.83 .27 | 53.2 0.3 |
| Apr. 9.6 | 44.20 +.27 | 26.7 -0.7 | 32.92 +.24 | 23.8 +1.2 | 14.60 +.47 | 55.0 +2.2 | 10.09 +.25 | 53.4 -0.1 |
| 19.6 | 44.45 .24 | 27.4 0.7 | 33.15 .21 | 25.1 1.5 | 15.23 .39 | 57.4 2.6 | 10.33 .23 | 53.4 +0.1 |
| 29.6 | 44.68 .22 | 28.1 0.6 | 33.34 .18 | 26.8 1.8 | 15.58 .30 | 60.2 2.9 | 10.55 .20 | 53.2 0.2 |
| May 9.6 | 44.89 .19 | 28.7 0.6 | 33.51 .15 | 28.6 1.9 | 15.83 .20 | 63.2 3.1 | 10.74 .18 | 52.9 0.3 |
| 19.5 | 45.06 .16 | 29.3 0.5 | 33.65 .12 | 30.7 2.0 | 15.98 +.09 | 66.4 3.2 | 10.90 .15 | 52.5 0.4 |
| 29.5 | 45.20 +.12 | 29.8 -0.5 | 33.76 +.09 | 32.8 +2.1 | 16.02 -0.2 | 69.6 +3.1 | 11.04 +.12 | 52.1 +0.5 |
| June 8.5 | 45.30 .08 | 30.3 0.5 | 33.82 .06 | 34.8 2.0 | 15.97 .11 | 72.7 3.0 | 11.14 .08 | 51.6 0.5 |
| 18.4 | 45.37 .06 | 30.8 0.4 | 33.86 +.01 | 36.9 1.9 | 15.81 .00 | 75.7 2.9 | 11.20 .05 | 51.1 0.5 |
| 28.4 | 45.40 +.01 | 31.2 0.4 | 33.85 -0.2 | 38.8 1.8 | 15.57 .29 | 78.4 2.6 | 11.24 +.01 | 50.6 0.4 |
| July 8.4 | 45.39 -0.3 | 31.5 0.3 | 33.82 .05 | 40.5 1.6 | 15.23 .37 | 80.8 2.2 | 11.23 -0.2 | 50.2 0.4 |
| 18.4 | 45.34 -0.7 | 31.8 -0.2 | 33.74 -0.9 | 42.0 +1.4 | 14.82 -0.45 | 82.9 +1.8 | 11.19 -0.5 | 49.8 +0.4 |
| 28.3 | 45.26 -1.0 | 32.0 0.2 | 33.63 .12 | 43.3 1.1 | 14.34 .51 | 84.5 1.4 | 11.12 .09 | 49.5 0.3 |
| Aug. 7.3 | 45.14 .13 | 32.1 -0.1 | 33.50 .14 | 44.2 0.8 | 13.80 .56 | 85.6 0.9 | 11.02 .12 | 49.2 0.3 |
| 17.3 | 45.00 .15 | 32.1 +0.1 | 33.34 .16 | 44.9 0.5 | 13.22 .59 | 86.3 +0.4 | 10.89 .14 | 48.9 0.2 |
| 27.3 | 44.84 .17 | 32.0 0.2 | 33.17 .18 | 45.2 +0.2 | 12.61 .61 | 86.4 -0.1 | 10.75 .15 | 48.7 0.2 |
| Sept. 6.2 | 44.66 -0.17 | 31.8 +0.3 | 32.98 -0.19 | 45.2 -0.2 | 11.99 -0.62 | 86.1 -0.6 | 10.59 -0.16 | 48.5 +0.1 |
| 16.2 | 44.49 .17 | 31.5 0.4 | 32.80 .16 | 44.9 0.5 | 11.37 .61 | 85.2 1.2 | 10.43 .15 | 48.4 +0.1 |
| 26.2 | 44.33 .16 | 31.1 0.4 | 32.62 .17 | 44.2 0.9 | 10.77 .58 | 83.8 1.7 | 10.28 .14 | 48.4 0.0 |
| Oct. 6.1 | 44.18 .13 | 30.6 0.5 | 32.46 .15 | 43.2 1.2 | 10.21 .53 | 81.8 2.1 | 10.14 .12 | 48.5 -0.1 |
| 16.1 | 44.07 .09 | 30.2 0.5 | 32.32 .12 | 41.8 1.5 | 9.70 .47 | 79.4 2.6 | 10.03 .09 | 48.6 0.2 |
| 26.1 | 43.99 -0.05 | 29.7 +0.4 | 32.23 -0.08 | 40.0 -1.9 | 9.27 -0.40 | 76.7 -3.0 | 9.95 -0.05 | 48.9 -0.4 |
| Nov. 5.1 | 43.97 .00 | 29.3 0.4 | 32.17 -0.03 | 38.0 2.2 | 8.93 .30 | 73.5 3.3 | 9.92 -0.01 | 49.4 0.5 |
| 15.0 | 43.99 +0.05 | 29.0 0.3 | 32.16 +0.02 | 35.7 2.4 | 8.68 .19 | 70.0 3.6 | 9.93 +0.04 | 49.9 0.7 |
| 25.0 | 44.08 .11 | 28.7 +0.1 | 32.20 .07 | 33.2 2.6 | 8.55 -0.07 | 66.3 3.8 | 9.99 .09 | 50.7 0.8 |
| Dec. 5.0 | 44.21 .16 | 28.7 -0.1 | 32.29 .12 | 30.5 2.7 | 8.54 +0.05 | 62.5 3.8 | 10.11 .14 | 51.6 1.0 |
| 15.0 | 44.40 +.21 | 28.8 -0.2 | 32.44 +.17 | 27.7 -2.8 | 8.64 +0.16 | 58.6 -3.8 | 10.27 +.18 | 52.7 -1.1 |
| 24.9 | 44.64 .26 | 29.1 0.4 | 32.63 .21 | 24.8 2.8 | 8.86 .28 | 54.9 3.7 | 10.48 .22 | 53.9 1.2 |
| 34.9 | 44.91 +.29 | 29.6 -0.6 | 32.86 +.25 | 22.0 -2.7 | 9.20 +.30 | 51.3 -2.4 | 10.72 +.26 | 55.2 -1.3 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Trianguli Australis. | | η Herculis. | | ϵ Ophiuchi. | | ϵ Ursæ Minoris. | |
|------------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|
| | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h ^m 16 37 | —68° 49' | ^h ^m 16 39 | +39° 7' | ^h ^m 16 52 | + 9° 32' | ^h ^m 16 56 | +82° 12' |
| (Dec.30.9) | ^s 2.28 +.55 | 25.7 +1.7 | ^s 7.38 +.23 | 40.0 —3.3 | ^s 28.40 +.21 | 38.6 —2.3 | ^s 62.48+ .52 | 47.6 —3.5 |
| Jan. 9.9 | 2.87 .63 | 24.1 1.4 | 7.63 .27 | 36.8 3.0 | 28.63 .24 | 36.4 2.2 | 63.14 .80 | 44.3 2.2 |
| 19.9 | 3.54 .69 | 22.9 1.0 | 7.92 .30 | 33.9 2.7 | 28.89 .27 | 34.3 2.0 | 64.08 1.06 | 41.2 2.8 |
| 29.8 | 4.26 .74 | 22.2 0.5 | 8.23 .33 | 31.3 2.3 | 29.17 .29 | 32.3 1.8 | 65.27 1.28 | 38.6 2.3 |
| Feb. 8.8 | 5.02 .77 | 21.8 +0.1 | 8.57 .35 | 29.3 1.8 | 29.46 .30 | 30.7 1.5 | 66.65 1.45 | 36.5 1.8 |
| 18.8 | 5.80 +.78 | 21.9 —0.3 | 8.93 +.35 | 27.8 —1.2 | 29.76 +.30 | 29.3 —1.2 | 68.17+1.56 | 35.1 —1.2 |
| 28.7 | 6.58 .77 | 22.4 0.7 | 9.28 .35 | 26.9 —0.6 | 30.06 .30 | 28.3 0.8 | 69.78 1.62 | 34.2 —0.5 |
| Mar.10.7 | 7.35 .76 | 23.2 1.0 | 9.63 .34 | 26 6 0.0 | 30.36 .29 | 27.7 —0.4 | 71.41 1.61 | 34.0 +0.1 |
| 20.7 | 8.09 .73 | 24.4 1.4 | 9.96 .32 | 26.8 +0.6 | 30.65 .28 | 27.5 0.0 | 73.00 1.54 | 34.5 0.8 |
| 30.7 | 8.80 .68 | 26.0 1.7 | 10.28 .30 | 27.7 1.1 | 30.93 .27 | 27.7 +0.4 | 74.50 1.42 | 35.6 1.4 |
| Apr. 9.6 | 9.46 +.63 | 27.9 —2.0 | 10.57 +.27 | 29.1 +1.6 | 31.19 +.26 | 28.3 +0.7 | 75.85+1.25 | 37.3 +1.2 |
| 19.6 | 10.06 .57 | 30.0 2.2 | 10.83 .24 | 30.9 2.0 | 31.44 .23 | 29.2 1.0 | 77.00 1.04 | 39.4 2.2 |
| 29.6 | 10.60 .50 | 32.3 2.4 | 11.05 .21 | 33.1 2.3 | 31.65 .21 | 30.3 1.2 | 77.94 .80 | 42.0 2.7 |
| May 9.5 | 11.07 .42 | 34.8 2.5 | 11.24 .17 | 35.6 2.6 | 31.85 .18 | 31.6 1.4 | 78.61 .54 | 44.8 2.9 |
| 19.5 | 11.45 .34 | 37.4 2.6 | 11.39 .12 | 38.3 2.7 | 32.02 .15 | 33.1 1.5 | 79.01+ .26 | 47.8 3.1 |
| 29.5 | 11.74 +.24 | 40.1 —2.7 | 11.50 +.08 | 41.1 +2.8 | 32.15 +.12 | 34.7 +1.6 | 79.14— .02 | 51.0 +3.1 |
| June 8.5 | 11.94 .15 | 42.8 2.7 | 11.56 +.04 | 43.8 2.7 | 32.26 .09 | 36.4 1.6 | 78.97 .30 | 54.1 3.0 |
| 18.4 | 12.04 +.05 | 45.4 2.6 | 11.58 .00 | 46.5 2.6 | 32.33 .05 | 38.0 1.5 | 78.54 .57 | 57.1 2.9 |
| 28.4 | 12.04 —.05 | 47.9 2.4 | 11.55 —.05 | 49.0 2.4 | 32.36 +.02 | 39.5 1.4 | 77.84 .82 | 59.9 2.7 |
| July 8.4 | 11.93 .14 | 50.3 2.2 | 11.48 .09 | 51.3 2.1 | 32.36 —.02 | 40 9 1.3 | 76.89 1.05 | 62.5 2.4 |
| 18.4 | 11.74 —.24 | 52.4 —1.9 | 11.37 —.13 | 53.3 +1.8 | 32.32 —.06 | 42.1 +1.2 | 75.73—1.26 | 64.8 +2.0 |
| 28.3 | 11.45 .22 | 54.2 1.6 | 11.22 .16 | 55.0 1.5 | 32.25 .09 | 43.2 1.0 | 74.38 1.43 | 66.6 1.6 |
| Aug. 7.3 | 11.09 .20 | 55.6 1.2 | 11.04 .12 | 56.3 1.1 | 32.14 .12 | 44.1 0.8 | 72.86 1.58 | 68.0 1.2 |
| 17.3 | 10.66 .45 | 56.6 0.8 | 10.82 .22 | 57.2 0.6 | 32.02 .14 | 44.7 0.5 | 71.21 1.69 | 68.9 0.7 |
| 27.2 | 10.18 .49 | 57.2 —0.3 | 10.59 .24 | 57.6 +0.2 | 31.86 .16 | 45.1 0.3 | 69.48 1.76 | 69.4 +0.2 |
| Sept. 6.2 | 9.68 —.50 | 57.2 +0.2 | 10.35 —.25 | 57.6 —0.2 | 31.70 —.17 | 45.3 +0.1 | 67.68—1.80 | 69.4 —0.3 |
| 16.2 | 9.18 .49 | 56.8 0.6 | 10.10 .24 | 57.1 0.7 | 31.53 .17 | 45.3 —0.2 | 65.88 1.79 | 68.8 0.8 |
| 26.2 | 8.70 .46 | 56.0 1.1 | 9.86 .23 | 56.2 1.1 | 31.36 .16 | 45.0 0.4 | 64.10 1.74 | 67.8 1.3 |
| Oct. 6.1 | 8.26 .40 | 54.6 1.5 | 9.64 .21 | 54.9 1.6 | 31.20 .14 | 44.4 0.7 | 62.40 1.65 | 66.2 1.8 |
| 16.1 | 7.90 .32 | 52.9 1.9 | 9.45 .18 | 53.1 2.0 | 31.07 .12 | 43.5 1.0 | 60.80 1.52 | 64.2 2.2 |
| 26.1 | 7.62 —.23 | 50.9 +2.2 | 9.29 —.14 | 50.9 —2.4 | 30.96 —.08 | 42.4 —1.2 | 59.36—1.34 | 61.8 —2.5 |
| Nov. 5.1 | 7.44 —.11 | 48.6 2.4 | 9.18 .09 | 48.4 2.7 | 30.90 —.04 | 41.1 1.5 | 58.12 1.13 | 58.9 3.0 |
| 15.0 | 7.39 +.01 | 46.2 2.5 | 9.12 —.03 | 45.5 3.0 | 30.88 .00 | 39.5 1.7 | 57.11 .88 | 55.8 3.3 |
| 25.0 | 7.46 .13 | 43.7 2.5 | 9.12 +.03 | 42.3 3.2 | 30.90 +.05 | 37.6 1.9 | 56.36 .60 | 52.4 3.5 |
| Dec. 5.0 | 7.66 .26 | 41.3 2.4 | 9.17 .09 | 39.0 3.4 | 30.98 .10 | 35.6 2.1 | 55.90— .30 | 48.8 3.6 |
| 14.9 | 7.99 +.28 | 39.0 +2.2 | 9.29 +.14 | 35.6 —3.4 | 31.10 +.15 | 33.5 —2.2 | 55.75 .00 | 45.1 —3.7 |
| 24.9 | 8.43 .42 | 36.9 1.9 | 9.46 .19 | 32.1 3.4 | 31.27 .19 | 31.2 2.2 | 55.91+ .22 | 41.5 3.6 |
| 34.9 | 8.97 +.50 | 35.1 +1.6 | 9.68 +.24 | 28.8 —3.2 | 31.48 +.22 | 29.0 —2.2 | 56.39+ .02 | 38.0 —3.4 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | δ Herculis. | | α^1 Herculis. | | β Ophiuchi. | | β Draconis. | |
|------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. |
| | ^h 16 57 | ^m +33 43 | ^h 17 9 | ^m +14 30 | ^h 17 19 | ^m -24 4 | ^h 17 27 | ^m +52 22 |
| (Dec.30.9) | ^s 32.73 +.30 | ^s 23.8 -3.2 | ^s 38.47 +.30 | ^s 49.8 -2.4 | ^s 40.22 +.22 | ^s 27.5 -0.3 | ^s 55.69 +.18 | ^s 48.7 -3.8 |
| Jan. 9.9 | 32.96 .34 | 25.6 3.0 | 38.68 .33 | 47.4 2.3 | 40.46 .26 | 27.9 0.4 | 55.89 .33 | 45.1 3.4 |
| 19.9 | 33.22 .38 | 22.8 2.7 | 38.93 .35 | 45.1 2.2 | 40.74 .29 | 28.3 0.5 | 56.15 .29 | 41.8 3.1 |
| 29.8 | 33.51 .30 | 20.2 2.3 | 39.20 .37 | 43.0 1.9 | 41.03 .31 | 28.8 0.5 | 56.47 .33 | 38.9 2.7 |
| Feb. 8.8 | 33.83 .32 | 18.1 1.9 | 39.48 .30 | 41.2 1.6 | 41.35 .33 | 29.4 0.5 | 56.82 .37 | 36.4 2.2 |
| 18.8 | 34.16 +.33 | 16.5 -1.3 | 39.78 +.30 | 39.8 -1.2 | 41.68 +.33 | 29.9 -0.5 | 57.21 +.40 | 34.4 -1.6 |
| 28.8 | 34.49 .33 | 15.5 0.8 | 40.08 .30 | 38.7 0.8 | 42.01 .33 | 30.5 0.5 | 57.61 .41 | 33.1 1.0 |
| Mar. 10.7 | 34.82 .33 | 15.0 -0.2 | 40.38 .30 | 38.1 -0.4 | 42.35 .33 | 31.0 0.5 | 58.03 .42 | 32.4 -0.3 |
| 20.7 | 35.14 .32 | 15.0 +0.4 | 40.68 .30 | 37.9 0.0 | 42.68 .33 | 31.4 0.4 | 58.44 .41 | 32.3 +0.3 |
| 30.7 | 35.45 .30 | 15.7 0.9 | 40.97 .38 | 38.2 +0.4 | 43.00 .31 | 31.8 0.3 | 58.85 .39 | 33.0 0.9 |
| Apr. 9.6 | 35.74 +.38 | 16.9 +1.4 | 41.24 +.36 | 38.9 +0.8 | 43.31 +.30 | 32.1 -0.3 | 59.23 +.36 | 34.2 +1.5 |
| 19.6 | 36.01 .35 | 18.5 1.8 | 41.49 .34 | 39.9 1.2 | 43.60 .28 | 32.3 0.2 | 59.58 .33 | 35.9 2.0 |
| 29.6 | 36.24 .32 | 20.5 2.1 | 41.72 .32 | 41.2 1.5 | 43.88 .26 | 32.5 0.2 | 59.89 .29 | 38.2 2.4 |
| May 9.6 | 36.44 .19 | 22.8 2.4 | 41.93 .19 | 42.8 1.7 | 44.13 .24 | 32.7 0.2 | 60.16 .24 | 40.8 2.7 |
| 19.5 | 36.61 .15 | 25.3 2.6 | 42.11 .17 | 44.6 1.8 | 44.35 .21 | 32.9 0.2 | 60.38 .19 | 43.7 3.0 |
| 29.5 | 36.74 +.11 | 27.9 +2.6 | 42.26 +.14 | 46.5 +1.9 | 44.55 +.18 | 33.1 -0.2 | 60.54 +.14 | 46.8 +3.2 |
| June 8.5 | 36.83 .07 | 30.6 2.6 | 42.38 .10 | 48.4 1.9 | 44.71 .14 | 33.2 0.2 | 60.65 .08 | 50.0 3.2 |
| 18.5 | 36.88 +.02 | 33.2 2.5 | 42.46 .06 | 50.3 1.8 | 44.83 .10 | 33.5 0.2 | 60.70 +.02 | 53.1 3.1 |
| 28.4 | 36.88 -.02 | 35.7 2.4 | 42.51 +.02 | 52.1 1.7 | 44.92 .06 | 33.7 0.2 | 60.69 -.04 | 56.2 3.0 |
| July 8.4 | 36.84 .06 | 38.0 2.1 | 42.51 -.01 | 53.8 1.6 | 44.96 +.02 | 33.9 0.2 | 60.62 .10 | 59.0 2.7 |
| 18.4 | 36.76 -.10 | 40.0 +1.9 | 42.48 -.05 | 55.3 +1.4 | 44.96 -.02 | 34.2 -0.2 | 60.49 -.15 | 61.6 +2.4 |
| 28.3 | 36.65 .13 | 41.7 1.6 | 42.41 .06 | 56.6 1.2 | 44.91 .06 | 34.4 0.2 | 60.30 .20 | 63.9 2.1 |
| Aug. 7.3 | 36.49 .16 | 43.1 1.2 | 42.31 .11 | 57.7 0.9 | 44.83 .10 | 34.6 0.2 | 60.07 .25 | 65.8 1.7 |
| 17.3 | 36.31 .19 | 44.2 0.8 | 42.18 .14 | 58.5 0.7 | 44.72 .13 | 34.8 0.1 | 59.80 .29 | 67.4 1.3 |
| 27.3 | 36.10 .21 | 44.8 +0.4 | 42.03 .16 | 59.1 0.4 | 44.57 .15 | 34.9 -0.1 | 59.49 .32 | 68.4 0.8 |
| Sept. 6.2 | 35.88 -.22 | 45.0 0.0 | 41.86 -.17 | 59.4 +0.1 | 44.41 -.17 | 35.0 0.0 | 59.16 -.34 | 69.0 +0.3 |
| 16.2 | 35.66 .23 | 44.8 -0.4 | 41.68 .18 | 59.4 -0.2 | 44.23 .18 | 34.9 +0.1 | 58.81 .35 | 69.0 -0.2 |
| 26.2 | 35.43 .22 | 44.2 0.8 | 41.50 .17 | 59.0 0.5 | 44.05 .17 | 34.8 0.1 | 58.46 .34 | 68.6 0.7 |
| Oct. 6.2 | 35.22 .20 | 43.1 1.2 | 41.33 .16 | 58.4 0.7 | 43.89 .16 | 34.7 0.2 | 58.12 .33 | 67.6 1.2 |
| 16.1 | 35.03 .17 | 41.6 1.7 | 41.18 .14 | 57.5 1.0 | 43.74 .13 | 34.5 0.2 | 57.81 .30 | 66.2 1.7 |
| 26.1 | 34.88 -.13 | 39.7 -2.1 | 41.06 -.11 | 56.3 -1.3 | 43.63 -.09 | 34.3 +0.2 | 57.52 -.26 | 64.3 -2.1 |
| Nov. 5.1 | 34.76 .09 | 37.4 2.4 | 40.98 .06 | 54.8 1.6 | 43.55 -.05 | 34.0 0.2 | 57.29 .21 | 61.9 2.6 |
| 15.0 | 34.70 -.04 | 34.9 2.7 | 40.93 -.02 | 53.1 1.9 | 43.52 .00 | 33.8 0.2 | 57.11 .15 | 59.1 3.0 |
| 25.0 | 34.68 +.01 | 32.0 3.0 | 40.94 +.03 | 51.1 2.1 | 43.54 +.05 | 33.7 +0.1 | 56.99 .08 | 56.0 3.3 |
| Dec. 5.0 | 34.73 .07 | 28.9 3.2 | 40.99 .08 | 48.8 2.3 | 43.62 .10 | 33.6 0.0 | 56.94 -.01 | 52.6 3.5 |
| 15.0 | 34.83 +.12 | 25.7 -3.2 | 41.10 +.13 | 46.5 -2.4 | 43.75 +.15 | 33.7 -0.1 | 56.96 +.06 | 49.0 -3.6 |
| 24.9 | 34.98 .17 | 22.4 3.2 | 41.25 .17 | 44.1 2.4 | 43.93 .20 | 33.9 0.2 | 57.05 .13 | 45.3 3.6 |
| 34.9 | 35.18 +.22 | 19.3 -3.1 | 41.44 +.21 | 41.6 -2.4 | 44.15 +.24 | 34.2 -0.3 | 57.22 +.20 | 41.7 -3.5 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Ophiuchi. | | α Draconis. | | μ Herculis. | | ψ^1 Draconis. | |
|------------------------|----------------------------|---------------------------|----------------------------|---------------------------|---------------------------|---------------------------|----------------------------|---------------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 17 29 | ^m +12° 38' | ^h 17 37 | ^m +68° 48' | ^h 17 42 | ^m +27° 46' | ^h 17 43 | ^m +72° 11' |
| Jan. 0.0 | ^s 50.27 +.18 | ["] 19.1 -2.3 | ^s 31.96 +.17 | ["] 22.7 -3.7 | ^s 9.34 +.16 | ["] 59.5 -3.0 | ^s 48.64 +.15 | ["] 60.9 -3.7 |
| 9.9 | 50.46 .31 | 16.8 2.2 | 32.18 .37 | 19.1 3.5 | 9.52 .19 | 56.5 2.9 | 48.86 .38 | 57.2 3.5 |
| 19.9 | 50.69 .34 | 14.6 2.1 | 32.51 .37 | 15.7 3.2 | 9.73 .23 | 53.7 2.7 | 49.21 .41 | 53.8 3.3 |
| 29.9 | 50.95 .36 | 12.5 1.9 | 32.94 .46 | 12.6 2.8 | 9.99 .26 | 51.2 2.4 | 49.67 .59 | 50.7 2.9 |
| Feb. 8.8 | 51.22 .28 | 10.8 1.6 | 33.44 .54 | 10.0 2.3 | 10.26 .28 | 49.0 2.0 | 50.24 .61 | 48.1 2.4 |
| 18.8 | 51.51 +.20 | 9.3 -1.2 | 34.02 +.59 | 8.0 -1.7 | 10.55 +.30 | 47.2 -1.5 | 50.89 +.68 | 46.0 -1.8 |
| 28.8 | 51.81 .30 | 8.3 0.8 | 34.63 .63 | 6.6 1.1 | 10.86 .31 | 45.9 1.0 | 51.60 .79 | 44.4 1.2 |
| Mar. 10.8 | 52.11 .30 | 7.6 -0.4 | 35.28 .64 | 5.8 -0.4 | 11.17 .31 | 45.1 -0.5 | 52.34 .75 | 43.6 -0.5 |
| 20.7 | 52.40 .39 | 7.4 0.0 | 35.92 .64 | 5.7 +0.2 | 11.48 .31 | 44.8 0.0 | 53.09 .74 | 43.4 +0.1 |
| 30.7 | 52.69 .26 | 7.6 +0.4 | 36.55 .61 | 6.3 0.8 | 11.70 .30 | 45.1 +0.5 | 53.83 .72 | 43.9 0.8 |
| Apr. 9.7 | 52.97 +.27 | 8.2 +0.8 | 37.15 +.57 | 7.5 +1.5 | 12.09 +.29 | 45.9 +1.0 | 54.52 +.67 | 45.0 +1.4 |
| 19.7 | 53.24 .26 | 9.1 1.1 | 37.69 .51 | 9.3 2.0 | 12.37 .37 | 47.2 1.5 | 55.16 .60 | 46.7 2.0 |
| 29.6 | 53.48 .23 | 10.4 1.4 | 38.17 .44 | 11.6 2.5 | 12.63 .25 | 48.9 1.9 | 55.72 .51 | 48.9 2.4 |
| May 9.6 | 53.71 .21 | 11.9 1.6 | 38.57 .35 | 14.2 2.8 | 12.87 .22 | 50.9 2.2 | 56.19 .41 | 51.6 2.8 |
| 19.6 | 53.91 .18 | 13.6 1.8 | 38.88 .28 | 17.2 3.1 | 13.08 .19 | 53.2 2.4 | 56.55 .30 | 54.5 3.0 |
| 29.5 | 54.08 +.15 | 15.4 +1.9 | 39.09 +.16 | 20.4 +3.2 | 13.25 +.16 | 55.6 +2.5 | 56.80 +.19 | 57.6 +3.2 |
| June 8.5 | 54.22 .12 | 17.3 1.9 | 39.21 +.06 | 23.7 3.3 | 13.39 .12 | 58.1 2.5 | 56.93 +.07 | 60.9 3.3 |
| 18.5 | 54.32 .08 | 19.2 1.8 | 39.22 -.04 | 27.0 3.2 | 13.49 .08 | 60.6 2.5 | 56.94 -.05 | 64.2 3.2 |
| 28.5 | 54.38 +.04 | 21.0 1.7 | 39.12 .14 | 30.2 3.1 | 13.55 +.03 | 63.1 2.4 | 56.82 .18 | 67.4 3.1 |
| July 8.4 | 54.41 .00 | 22.6 1.6 | 38.93 .24 | 33.2 2.9 | 13.57 -.01 | 65.4 2.2 | 56.59 .20 | 70.4 2.9 |
| 18.4 | 54.39 -.03 | 24.2 +1.4 | 38.64 -.33 | 36.0 +2.6 | 13.54 -.05 | 67.6 +2.0 | 56.24 -.40 | 73.2 +2.6 |
| 28.4 | 54.34 .07 | 25.5 1.2 | 38.27 .42 | 38.5 2.3 | 13.47 .09 | 69.5 1.8 | 55.79 .50 | 75.7 2.3 |
| Aug. 7.4 | 54.25 .10 | 26.6 1.0 | 37.81 .49 | 40.6 1.8 | 13.36 .13 | 71.1 1.5 | 55.24 .58 | 77.8 1.9 |
| 17.3 | 54.13 .13 | 27.5 0.7 | 37.29 .55 | 42.2 1.4 | 13.22 .16 | 72.4 1.1 | 54.62 .66 | 79.5 1.5 |
| 27.3 | 53.99 .15 | 28.2 0.5 | 36.72 .60 | 43.4 0.9 | 13.04 .19 | 73.4 0.8 | 53.92 .73 | 80.8 1.0 |
| Sept. 6.3 | 53.82 -.17 | 28.5 +0.2 | 36.10 -.63 | 44.1 +0.4 | 12.85 -.20 | 74.0 +0.4 | 53.19 -.75 | 81.6 +0.5 |
| 16.2 | 53.65 .18 | 28.6 -0.1 | 35.46 .64 | 44.3 -0.1 | 12.64 .21 | 74.1 0.0 | 52.42 .77 | 81.8 0.0 |
| 26.2 | 53.47 .17 | 28.4 0.3 | 34.81 .64 | 43.9 0.6 | 12.42 .21 | 74.0 -0.4 | 51.64 .77 | 81.6 -0.5 |
| Oct. 6.2 | 53.30 .16 | 27.9 0.6 | 34.18 .62 | 43.0 1.1 | 12.21 .20 | 73.4 0.8 | 50.87 .75 | 80.9 1.1 |
| 16.2 | 53.14 .14 | 27.2 0.9 | 33.58 .58 | 41.6 1.6 | 12.02 .18 | 72.4 1.2 | 50.13 .71 | 79.4 1.6 |
| 26.1 | 53.01 -.11 | 26.1 -1.2 | 33.02 -.62 | 39.8 -2.1 | 11.85 -.15 | 71.0 -1.6 | 49.45 -.65 | 77.6 -2.1 |
| Nov. 5.1 | 52.91 .08 | 24.8 1.5 | 32.53 .45 | 37.4 2.6 | 11.72 .11 | 69.2 1.9 | 48.84 .56 | 75.3 2.5 |
| 15.1 | 52.86 -.03 | 23.2 1.7 | 32.13 .26 | 34.6 3.0 | 11.62 .07 | 67.1 2.3 | 48.32 .46 | 72.6 2.9 |
| 25.1 | 52.85 +.01 | 21.3 1.9 | 31.82 .26 | 31.4 3.3 | 11.57 -.02 | 64.7 2.5 | 47.92 .34 | 69.5 3.2 |
| Dec. 5.0 | 52.88 .06 | 19.3 2.1 | 31.61 .15 | 28.0 3.5 | 11.58 +.03 | 62.0 2.8 | 47.64 .21 | 66.1 3.5 |
| 15.0 | 52.97 +.11 | 17.1 -2.2 | 31.52 -.03 | 24.3 -3.7 | 11.63 +.08 | 59.2 -2.9 | 47.49 -.08 | 62.5 -3.7 |
| 25.0 | 53.10 .15 | 14.8 2.3 | 31.56 +.09 | 20.6 3.7 | 11.73 .13 | 56.2 3.0 | 47.48 +.06 | 58.7 3.7 |
| 34.9 | 53.27 +.19 | 12.5 -2.3 | 31.70 +.21 | 16.9 -3.6 | 11.88 +.17 | 53.3 -3.0 | 47.61 +.20 | 55.0 -3.6 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | γ Draconis. | | γ^s Sagittarii. | | μ Sagittarii. | | η Serpentis. | |
|------------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|-----------------------------------|-----------------------|------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination South. | Right Ascension. | Declination South. |
| | ^h ^m 15 54 | +51° 29' | ^h ^m 17 58 | —30° 25' | ^h ^m 18 7 | —21° 5' | ^h ^m 18 15 | — 2° 55' |
| Jan. 0.0 | ^s 1.92 +.13 | 60.5 —3.6 | ^s 45.56 +.30 | 31.1 +0.3 | ^s 12.10 +.17 | 15.1 —0.3 | ^s 37.82 +.15 | 38.9 —1.3 |
| 9.9 | 2.08 .19 | 57.0 3.5 | 45.77 .33 | 30.9 0.2 | 12.29 .21 | 15.4 0.3 | 37.99 .18 | 40.3 1.4 |
| 19.9 | 2.30 .25 | 53.6 3.2 | 46.03 .37 | 30.7 +0.1 | 12.52 .24 | 15.7 0.3 | 38.18 .21 | 41.6 1.3 |
| 29.9 | 2.58 .30 | 50.5 2.9 | 46.31 .30 | 30.6 0.0 | 12.78 .27 | 16.0 0.3 | 38.41 .24 | 42.9 1.2 |
| Feb. 8.9 | 2.90 .34 | 47.8 2.4 | 46.62 .32 | 30.6 0.0 | 13.06 .29 | 16.4 0.3 | 38.66 .26 | 44.0 1.0 |
| 18.8 | 3.26 +.37 | 45.7 —1.9 | 46.95 +.33 | 30.7 0.0 | 13.36 +.30 | 16.7 —0.3 | 38.92 +.28 | 45.0 —0.8 |
| 28.8 | 3.64 .39 | 44.1 1.3 | 47.29 .34 | 30.7 —0.1 | 13.67 .31 | 16.9 0.2 | 39.21 .30 | 45.7 0.6 |
| Mar. 10.8 | 4.04 .40 | 43.1 —0.6 | 47.64 .35 | 30.8 0.1 | 13.99 .32 | 17.1 —0.1 | 39.50 .32 | 46.1 —0.3 |
| 20.8 | 4.45 .40 | 42.8 0.0 | 47.98 .35 | 30.9 0.1 | 14.31 .32 | 17.1 0.0 | 39.79 .30 | 46.3 0.0 |
| 30.7 | 4.8C .39 | 43.2 +0.6 | 48.33 .34 | 31.0 0.1 | 14.63 .32 | 17.1 +0.1 | 40.09 .32 | 46.2 +0.2 |
| Apr. 9.7 | 5.24 +.37 | 44.1 +1.2 | 48.68 +.33 | 31.1 —0.1 | 14.95 +.31 | 17.0 +0.1 | 40.38 +.29 | 45.9 +0.5 |
| 19.7 | 5.61 .35 | 45.6 1.8 | 49.01 .32 | 31.3 0.1 | 15.26 .30 | 16.8 0.2 | 40.67 .32 | 45.2 0.7 |
| 29.6 | 5.94 .32 | 47.7 2.3 | 49.32 .31 | 31.4 0.2 | 15.56 .32 | 16.6 0.2 | 40.95 .37 | 44.4 0.9 |
| May 9.6 | 6.24 .27 | 50.2 2.6 | 49.62 .30 | 31.6 0.2 | 15.84 .27 | 16.4 0.2 | 41.21 .35 | 43.4 1.0 |
| 19.6 | 6.48 .22 | 53.0 2.9 | 49.89 .26 | 31.9 0.3 | 16.10 .25 | 16.1 0.3 | 41.45 .33 | 42.4 1.1 |
| 29.6 | 6.68 +.17 | 56.0 +3.1 | 50.14 +.23 | 32.2 —0.4 | 16.34 +.22 | 15.9 +0.2 | 41.66 +.20 | 41.2 +1.2 |
| June 8.5 | 6.83 .19 | 59.2 3.2 | 50.35 .19 | 32.6 0.4 | 16.54 .19 | 15.7 0.2 | 41.85 .17 | 40.0 1.2 |
| 18.5 | 6.92 +.06 | 62.4 3.2 | 50.52 .15 | 33.0 0.5 | 16.71 .15 | 15.5 +0.1 | 42.01 .14 | 38.8 1.2 |
| 28.5 | 6.94 .00 | 65.5 3.1 | 50.65 .10 | 33.5 0.5 | 16.83 .11 | 15.5 0.0 | 42.13 .10 | 37.6 1.1 |
| July 8.4 | 6.91 —.06 | 68.6 2.9 | 50.73 .06 | 34.1 0.6 | 16.92 .06 | 15.5 0.0 | 42.21 .06 | 36.6 1.0 |
| 18.4 | 6.82 —.12 | 71.4 +2.7 | 50.77 +.01 | 34.7 —0.6 | 16.96 +.02 | 15.5 —0.1 | 42.25 +.02 | 35.7 +0.9 |
| 28.4 | 6.67 .17 | 73.9 2.4 | 50.76 —.03 | 35.3 0.6 | 16.96 —.02 | 15.6 0.1 | 42.24 —.02 | 34.9 0.7 |
| Aug. 7.4 | 6.47 .22 | 76.1 2.0 | 50.70 .08 | 35.8 0.5 | 16.91 .06 | 15.8 0.2 | 42.20 .06 | 34.2 0.6 |
| 17.3 | 6.22 .26 | 77.9 1.6 | 50.60 .12 | 36.4 0.5 | 16.83 .10 | 16.0 0.2 | 42.12 .10 | 33.7 0.4 |
| 27.3 | 5.94 .30 | 79.2 1.1 | 50.46 .15 | 36.8 0.4 | 16.71 .13 | 16.2 0.2 | 42.00 .13 | 33.3 0.3 |
| Sept. 6.3 | 5.62 —.33 | 80.2 +0.7 | 50.30 —.17 | 37.1 —0.3 | 16.56 —.15 | 16.3 —0.2 | 41.86 —.15 | 33.0 +0.1 |
| 16.3 | 5.28 .34 | 80.6 +0.2 | 50.12 .18 | 37.4 —0.2 | 16.40 .17 | 16.4 0.1 | 41.70 .16 | 33.0 0.0 |
| 26.2 | 4.94 .34 | 80.5 —0.3 | 49.93 .19 | 37.4 0.0 | 16.22 .17 | 16.6 —0.1 | 41.54 .17 | 33.0 —0.1 |
| Oct. 6.2 | 4.60 .33 | 79.9 0.9 | 49.74 .18 | 37.4 +0.1 | 16.05 .16 | 16.6 0.0 | 41.37 .16 | 33.2 0.3 |
| 16.2 | 4.28 .31 | 78.8 1.4 | 49.57 .16 | 37.2 0.2 | 15.88 .15 | 16.6 0.0 | 41.21 .15 | 33.6 0.4 |
| 26.1 | 3.98 —.26 | 77.2 —1.8 | 49.42 —.13 | 36.9 +0.3 | 15.74 —.12 | 16.6 0.0 | 41.07 —.12 | 34.0 —0.6 |
| Nov. 5.1 | 3.72 .23 | 75.1 2.3 | 49.31 .09 | 36.5 0.4 | 15.64 .08 | 16.6 0.0 | 40.96 .09 | 34.7 0.7 |
| 15.1 | 3.52 .18 | 72.6 2.7 | 49.24 —.04 | 36.1 0.5 | 15.57 —.04 | 16.6 0.0 | 40.88 .06 | 35.5 0.9 |
| 25.1 | 3.37 .12 | 69.7 3.1 | 49.23 +.01 | 35.6 0.5 | 15.55 .00 | 16.6 0.0 | 40.85 —.01 | 36.4 1.0 |
| Dec. 5.0 | 3.29 —.05 | 66.5 3.3 | 49.26 .06 | 35.2 0.4 | 15.58 +.05 | 16.7 —0.1 | 40.86 +.03 | 37.5 1.1 |
| 15.0 | 3.27 +.02 | 63.0 —3.5 | 49.36 +.12 | 34.7 +0.4 | 15.66 +.10 | 16.8 —0.2 | 40.91 +.02 | 38.7 —1.2 |
| 25.0 | 3.32 .09 | 59.5 3.6 | 49.50 .17 | 34.4 0.3 | 15.78 .15 | 17.0 0.2 | 41.01 .12 | 40.0 1.3 |
| 35.0 | 3.44 +.15 | 55.9 —3.6 | 49.69 +.21 | 34.1 +0.2 | 15.95 +.19 | 17.3 —0.3 | 41.15 +.16 | 41.4 —1.4 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | 1 Aquilæ. | | α Lyrae. (Vega.) | | σ Octantis. | | β Lyrae. | | |
|------------------------|-----------------------|------------------------|----------------------------|------------------------|--|------------------------|-----------------------|------------------------|-----------|
| | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | |
| | ^h 18 29 | ^m — 8 19 | ^h 18 33 | ^m +38 40 | ^h 18 | ^m —89 15 | ^h 18 46 | ^m +33 13 | |
| | ^s | ^s | ^s | ^s | ^m ^s ^s | ^s | ^s | ^s | |
| Jan. 0.0 | 14.13 +.14 | 15.9 —1.0 | 12.50 +.09 | 52.1 —3.2 | 41 51.4+ 4.2 | 61.4 +3.4 | 1.00 +.06 | 66.4 —3.0 | |
| 10.0 | 14.28 .17 | 16.9 1.0 | 12.61 .13 | 48.9 3.2 | 41 57.3 7.4 | 58.1 3.2 | 1.11 .12 | 63.4 3.0 | |
| 19.9 | 14.47 .20 | 17.9 0.9 | 12.77 .18 | 45.8 3.1 | 42 6.2 10.4 | 55.0 3.0 | 1.25 .16 | 60.4 2.9 | |
| 29.9 | 14.69 .23 | 18.8 0.8 | 12.98 .22 | 42.8 2.8 | 42 18.0 13.0 | 52.1 2.7 | 1.44 .20 | 57.6 2.7 | |
| Feb. 8.9 | 14.94 .26 | 19.6 0.7 | 13.22 .26 | 40.2 2.4 | 42 32.2 15.3 | 49.5 2.4 | 1.67 .24 | 55.1 2.4 | |
| | 18.9 | 15.20 +.28 | 20.3 —0.6 | 13.50 +.29 | 38.0 —2.0 | 42 48.4+17.1 | 47.3 +2.0 | 1.92 +.27 | 53.0 —2.0 |
| 28.8 | 15.49 .29 | 20.8 0.4 | 13.80 .31 | 36.2 1.5 | 43 6.3 18.5 | 45.5 1.6 | 2.20 .20 | 51.2 1.5 | |
| Mar. 10.8 | 15.78 .30 | 21.1 —0.2 | 14.12 .33 | 35.1 0.9 | 43 25.4 19.6 | 44.1 1.1 | 2.50 .31 | 50.1 0.9 | |
| 20.8 | 16.08 .30 | 21.2 0.0 | 14.46 .34 | 34.5 —0.3 | 43 45.3 20.1 | 43.2 0.6 | 2.82 .32 | 49.4 —0.3 | |
| 30.7 | 16.38 .30 | 21.0 +0.3 | 14.80 .34 | 34.5 +0.3 | 44 5.5 20.2 | 42.8 +0.1 | 3.14 .32 | 49.4 +0.2 | |
| Apr. 9.7 | 16.68 +.30 | 20.7 +0.5 | 15.14 +.33 | 35.1 +0.9 | 44 25.7+20.0 | 43.0 —0.3 | 3.47 +.32 | 49.9 +0.8 | |
| 19.7 | 16.98 .29 | 20.1 0.6 | 15.47 .32 | 36.2 1.4 | 44 45.4 19.3 | 43.5 0.8 | 3.78 .31 | 50.9 1.3 | |
| 29.7 | 17.26 .26 | 19.4 0.8 | 15.78 .30 | 37.9 1.9 | 45 4.2 18.2 | 44.6 1.3 | 4.09 .30 | 52.4 1.7 | |
| May 9.6 | 17.54 .26 | 18.5 0.9 | 16.08 .28 | 40.0 2.2 | 45 21.8 18.8 | 46.1 1.7 | 4.38 .28 | 54.4 2.1 | |
| 19.6 | 17.80 .24 | 17.6 1.0 | 16.34 .26 | 42.4 2.6 | 45 37.7 15.0 | 48.0 2.1 | 4.65 .26 | 56.6 2.4 | |
| | 29.6 | 18.03 +.22 | 16.6 +1.0 | 16.57 +.21 | 45.1 +2.8 | 45 51.8+12.9 | 50.2 —2.4 | 4.88 +.22 | 59.2 +2.6 |
| June 8.6 | 18.24 .19 | 15.6 0.9 | 16.76 .17 | 48.0 2.9 | 46 3.5 10.5 | 52.8 2.7 | 5.09 .18 | 62.0 2.8 | |
| 18.5 | 18.41 .16 | 14.7 0.9 | 16.91 .19 | 51.0 3.0 | 46 12.7 7.9 | 55.6 2.9 | 5.25 .14 | 64.8 2.9 | |
| 28.5 | 18.55 .12 | 13.8 0.8 | 17.01 .07 | 54.0 2.9 | 46 19.2 5.0 | 58.6 3.0 | 5.37 .09 | 67.7 2.8 | |
| July 8.5 | 18.64 .08 | 13.0 0.7 | 17.06 +.02 | 57.0 2.8 | 46 22.7+ 2.0 | 61.7 3.1 | 5.44 +.05 | 70.5 2.7 | |
| | 18.4 | 18.70 +.03 | 12.3 +0.6 | 17.06 —0.3 | 59.8 +2.7 | 46 23.3— 1.0 | 64.8 —3.1 | 5.46 .00 | 73.2 +2.6 |
| 28.4 | 18.71 —0.1 | 11.8 0.5 | 17.01 .07 | 62.4 2.5 | 46 20.8 4.0 | 67.8 3.0 | 5.44 —0.5 | 75.7 2.4 | |
| Aug. 7.4 | 18.68 .05 | 11.3 0.4 | 16.91 .12 | 64.7 2.2 | 46 15.3 6.8 | 70.7 2.7 | 5.37 .09 | 77.9 2.1 | |
| 17.4 | 18.61 .09 | 11.0 0.3 | 16.76 .16 | 66.7 1.8 | 46 7.2 9.5 | 73.3 2.4 | 5.25 .13 | 79.9 1.8 | |
| 27.3 | 18.51 .12 | 10.8 0.2 | 16.58 .20 | 68.3 1.4 | 45 56.5 11.8 | 75.6 2.0 | 5.10 .17 | 81.5 1.4 | |
| Sept. 6.3 | 18.37 —1.4 | 10.6 +0.1 | 16.37 —2.3 | 69.6 +1.0 | 45 43.7—13.7 | 77.4 —1.5 | 4.92 —2.0 | 82.8 +1.0 | |
| 16.3 | 18.22 .16 | 10.6 0.0 | 16.13 .25 | 70.4 0.6 | 45 29.2 15.1 | 78.7 1.0 | 4.70 .22 | 83.6 0.6 | |
| 26.3 | 18.06 .17 | 10.7 —0.1 | 15.88 .26 | 70.8 +0.1 | 45 13.7 15.9 | 79.4 —0.5 | 4.48 .23 | 84.1 +0.2 | |
| Oct. 6.2 | 17.89 .16 | 10.9 0.2 | 15.62 .25 | 70.7 —0.3 | 44 57.6 16.1 | 79.6 +0.1 | 4.25 .23 | 84.1 —0.2 | |
| 16.2 | 17.73 .15 | 11.1 0.3 | 15.37 .24 | 70.1 0.8 | 44 41.7 15.6 | 79.1 0.7 | 4.02 .22 | 83.7 0.6 | |
| | 26.2 | 17.59 —1.3 | 11.5 —0.4 | 15.14 —2.2 | 69.1 —1.2 | 44 26.6—14.4 | 78.1 +1.3 | 3.81 —2.0 | 82.8 —1.1 |
| Nov. 5.1 | 17.47 .10 | 11.9 0.5 | 14.94 .19 | 67.6 1.7 | 44 13.0 12.7 | 76.4 1.9 | 3.62 .17 | 81.5 1.5 | |
| 15.1 | 17.39 .06 | 12.5 0.6 | 14.77 .15 | 65.7 2.1 | 44 1.4 10.4 | 74.3 2.4 | 3.46 .14 | 79.8 1.9 | |
| 25.1 | 17.35 —0.2 | 13.1 0.7 | 14.64 .10 | 63.4 2.5 | 43 52.3 7.6 | 71.7 2.8 | 3.34 .09 | 77.8 2.2 | |
| Dec. 5.1 | 17.35 +0.2 | 13.9 0.8 | 14.56 —0.5 | 60.8 2.8 | 43 46.2 4.5 | 68.8 3.1 | 3.27 —0.5 | 75.3 2.5 | |
| | 15.0 | 17.40 +.07 | 14.8 —0.9 | 14.54 .00 | 57.9 —3.0 | 43 43.2— 1.3 | 65.6 +3.2 | 3.24 .00 | 72.7 —2.8 |
| 25.0 | 17.49 .11 | 15.7 0.9 | 14.57 +.05 | 54.8 3.1 | 43 43.6+ 2.1 | 62.3 3.3 | 3.27 +.05 | 69.8 2.0 | |
| 35.0 | 17.62 +.15 | 16.6 —1.0 | 14.65 +.11 | 51.6 —3.2 | 43 47.4+ 5.4 | 58.9 +3.4 | 3.34 +.10 | 66.8 —3.0 | |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | σ Sagittarii. | | 50 Draconis. | | ζ Aquilæ. | | δ Sagittarii. | |
|------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|
| | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination South. |
| | ^h 18 48 | ^m —26° 25' | ^h 18 49 | ^m +75° 17' | ^h 19 0 | ^m +13° 41' | ^h 19 11 | ^m —19° 8' |
| Jan. 0.0 | ^s 27.71 +.14 | ^s 58.8 +0.2 | ^s 48.28 —.10 | ^s 75.7 —3.5 | ^s 21.75 +.08 | ^s 61.8 —2.1 | ^s 12.92 +.10 | ^s 53.2 —0.2 |
| 10.0 | 27.86 .18 | 58.5 0.2 | 48.26 +.07 | 72.1 3.5 | 21.85 .12 | 59.6 2.1 | 13.04 .14 | 53.4 0.2 |
| 20.0 | 28.06 .21 | 58.3 0.2 | 48.41 .23 | 68.6 3.5 | 21.99 .16 | 57.5 2.0 | 13.20 .18 | 53.5 0.1 |
| 29.9 | 28.29 .24 | 58.1 0.2 | 48.72 .38 | 65.2 3.3 | 22.17 .19 | 55.6 1.9 | 13.40 .21 | 53.6 —0.1 |
| Feb. 8.9 | 28.55 .27 | 57.9 0.2 | 49.18 .52 | 62.0 2.9 | 22.38 .22 | 53.8 1.6 | 13.62 .24 | 53.7 0.0 |
| 18.9 | 28.83 +.29 | 57.7 +0.2 | 49.77 +.65 | 59.3 —2.5 | 22.61 +.24 | 52.3 —1.3 | 13.87 +.26 | 53.7 +0.1 |
| 28.8 | 29.14 .31 | 57.5 0.3 | 50.47 .75 | 57.1 1.9 | 22.86 .26 | 51.1 1.0 | 14.14 .28 | 53.6 0.2 |
| Mar. 10.8 | 29.45 .32 | 57.2 0.3 | 51.26 .83 | 55.5 1.3 | 23.13 .28 | 50.3 0.6 | 14.43 .30 | 53.3 0.3 |
| 20.8 | 29.78 .33 | 56.9 0.3 | 52.10 .86 | 54.4 —0.7 | 23.42 .29 | 49.9 —0.2 | 14.74 .31 | 53.0 0.4 |
| 30.8 | 30.12 .34 | 56.6 0.4 | 52.98 .87 | 54.1 0.0 | 23.71 .30 | 50.0 +0.2 | 15.05 .32 | 52.5 0.5 |
| Apr. 9.7 | 30.45 +.34 | 56.2 +0.4 | 53.85 +.86 | 54.4 +0.6 | 24.01 +.30 | 50.4 +0.7 | 15.37 +.22 | 52.0 +0.6 |
| 19.7 | 30.79 .33 | 55.8 0.4 | 54.70 .82 | 55.3 1.2 | 24.30 .29 | 51.3 1.1 | 15.69 .32 | 51.3 0.7 |
| 29.7 | 31.12 .32 | 55.4 0.4 | 55.49 .75 | 56.9 1.8 | 24.59 .28 | 52.5 1.4 | 16.01 .31 | 50.6 0.7 |
| May 9.7 | 31.43 .31 | 55.0 0.3 | 56.19 .66 | 58.9 2.2 | 24.87 .27 | 54.0 1.7 | 16.32 .30 | 49.9 0.7 |
| 19.6 | 31.73 .29 | 54.8 0.3 | 56.80 .54 | 61.4 2.7 | 25.14 .25 | 55.8 1.9 | 16.61 .29 | 49.1 0.7 |
| 29.6 | 32.01 +.26 | 54.5 +0.2 | 57.28 +.42 | 64.3 +3.0 | 25.38 +.23 | 57.8 +2.0 | 16.89 +.27 | 48.4 +0.7 |
| June 8.6 | 32.26 .23 | 54.4 +0.1 | 57.64 .28 | 67.4 3.2 | 25.59 .20 | 59.9 2.1 | 17.15 .24 | 47.8 0.6 |
| 18.5 | 32.47 .20 | 54.4 0.0 | 57.85 +.14 | 70.7 3.3 | 25.78 .17 | 62.0 2.1 | 17.37 .20 | 47.3 0.5 |
| 28.5 | 32.65 .15 | 54.5 —0.1 | 57.92 —.01 | 74.1 3.4 | 25.92 .13 | 64.2 2.1 | 17.56 .18 | 46.8 0.4 |
| July 8.5 | 32.78 .11 | 54.7 0.2 | 57.83 .16 | 77.4 3.3 | 26.03 .08 | 66.2 2.0 | 17.70 .12 | 46.5 0.3 |
| 18.5 | 32.86 +.06 | 55.0 —0.3 | 57.60 —.30 | 80.7 +3.2 | 26.09 +.04 | 68.2 +1.9 | 17.80 +.06 | 46.3 +0.1 |
| 28.4 | 32.90 +.01 | 55.4 0.4 | 57.23 .44 | 83.8 2.9 | 26.12 .00 | 70.0 1.7 | 17.86 +.02 | 46.3 0.0 |
| Aug. 7.4 | 32.89 —.03 | 55.8 0.5 | 56.73 .56 | 86.7 2.7 | 26.09 —.04 | 71.6 1.5 | 17.87 —.01 | 46.3 —0.1 |
| 17.4 | 32.83 .07 | 56.3 0.5 | 56.11 .67 | 89.2 2.4 | 26.03 .08 | 72.9 1.9 | 17.83 .06 | 46.5 0.2 |
| 27.4 | 32.73 .11 | 56.8 0.5 | 55.38 .77 | 91.4 2.0 | 25.93 .12 | 74.0 1.0 | 17.75 .09 | 46.7 0.2 |
| Sept. 6.3 | 32.60 —.14 | 57.2 —0.4 | 54.56 —.85 | 93.1 +1.5 | 25.79 —.15 | 74.9 +0.7 | 17.64 —.12 | 47.0 —0.3 |
| 16.3 | 32.44 .17 | 57.6 0.3 | 53.68 .91 | 94.5 1.0 | 25.64 .17 | 75.5 0.4 | 17.50 .15 | 47.2 0.3 |
| 26.3 | 32.27 .18 | 58.0 0.3 | 52.74 .94 | 95.2 +0.5 | 25.46 .18 | 75.8 +0.1 | 17.34 .16 | 47.5 0.3 |
| Oct. 6.2 | 32.09 .18 | 58.2 0.2 | 51.79 .95 | 95.6 0.0 | 25.28 .18 | 75.8 —0.2 | 17.17 .17 | 47.8 0.3 |
| 16.2 | 31.91 .17 | 58.3 —0.1 | 50.84 .94 | 95.3 —0.5 | 25.10 .17 | 75.5 0.4 | 17.00 .16 | 48.1 0.2 |
| 26.2 | 31.75 —.15 | 58.4 0.0 | 49.91 —.90 | 94.6 —1.0 | 24.94 —.16 | 74.9 —0.7 | 16.84 —.15 | 48.3 —0.2 |
| Nov. 5.2 | 31.61 .12 | 58.3 +0.1 | 49.03 .84 | 93.2 1.5 | 24.79 .13 | 74.0 1.0 | 16.71 .12 | 48.5 0.2 |
| 15.1 | 31.52 .08 | 58.2 0.2 | 48.23 .75 | 91.4 2.0 | 24.67 .10 | 72.8 1.3 | 16.60 .09 | 48.7 0.2 |
| 25.1 | 31.46 —.03 | 58.0 0.2 | 47.52 .64 | 89.1 2.5 | 24.59 .06 | 71.4 1.5 | 16.53 —.05 | 48.8 0.1 |
| Dec. 5.1 | 31.44 +.01 | 57.7 0.2 | 46.94 .51 | 86.4 2.9 | 24.55 —.02 | 69.7 1.7 | 16.50 .00 | 49.0 0.1 |
| 15.1 | 31.48 +.06 | 57.5 +0.2 | 46.50 —.36 | 83.3 —3.2 | 24.55 +.02 | 67.8 —1.9 | 16.52 +.04 | 49.1 —0.1 |
| 25.0 | 31.57 .11 | 57.2 0.2 | 46.22 .20 | 79.9 3.4 | 24.50 .06 | 65.8 2.0 | 16.58 .08 | 49.3 0.2 |
| 35.0 | 31.70 +.15 | 57.0 +0.2 | 46.09 —.04 | 76.4 —3.6 | 24.67 +.10 | 63.7 —2.1 | 16.68 +.12 | 49.4 —0.2 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | δ Draconis. | | τ Draconis. | | δ Aquilæ. | | κ Aquilæ. | |
|------------------------|-----------------------|--------------------------|-----------------------|-------------------------|-----------------------|--------------------------|-----------------------|--------------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination South. |
| | ^h 19 12 | ^m +67° 27' | ^h 19 17 | ^m +73° 8' | ^h 19 19 | ^m + 2° 53' | ^h 19 30 | ^m - 7° 16' |
| Jan. 0.0 | 28.14 -08 | 69.6 -3.5 | 34.47 -16 | 69.5 -3.5 | 57.86 +08 | 46.8 -1.4 | 59.28 +07 | 16.0 -0.8 |
| 10.0 | 28.12 +03 | 66.0 3.6 | 34.37 -08 | 65.9 3.5 | 57.95 .11 | 45.3 1.5 | 59.38 .11 | 16.9 0.8 |
| 20.0 | 28.20 .13 | 62.4 3.5 | 34.42 +19 | 62.4 3.5 | 58.09 .13 | 43.8 1.4 | 59.50 .14 | 17.7 0.8 |
| 29.0 | 28.39 .23 | 58.9 3.3 | 34.62 .96 | 58.9 3.4 | 58.25 .18 | 42.5 1.3 | 59.67 .18 | 18.4 0.7 |
| Feb. 8.9 | 28.68 .33 | 55.7 3.0 | 34.95 .39 | 55.6 3.1 | 58.45 .91 | 41.3 1.1 | 59.86 .91 | 19.1 0.6 |
| 18.9 | 29.06 +49 | 52.8 -2.6 | 35.40 +51 | 52.7 -2.7 | 58.67 +33 | 40.2 -0.9 | 60.08 +33 | 19.5 -0.4 |
| 28.9 | 29.51 .49 | 50.4 2.1 | 35.96 .60 | 50.2 2.2 | 58.91 .25 | 39.5 0.6 | 60.32 .25 | 19.8 -0.3 |
| Mar. 10.8 | 30.03 .54 | 48.6 1.5 | 36.61 .68 | 48.3 1.6 | 59.17 .27 | 39.0 -0.3 | 60.58 .27 | 19.9 0.0 |
| 20.8 | 30.59 .58 | 47.3 0.9 | 37.33 .73 | 47.0 1.0 | 59.45 .28 | 38.9 0.0 | 60.86 .28 | 19.7 +0.3 |
| 30.8 | 31.19 .60 | 46.7 -0.2 | 38.08 .76 | 46.3 -0.3 | 59.73 .29 | 39.1 +0.3 | 61.15 .29 | 19.4 0.5 |
| Apr. 9.7 | 31.79 +00 | 46.8 +0.4 | 38.86 +77 | 46.2 +0.3 | 60.03 +30 | 39.6 +0.7 | 61.45 +30 | 18.7 +0.7 |
| 19.7 | 32.39 .58 | 47.5 1.0 | 39.62 .75 | 46.8 0.9 | 60.33 .30 | 40.4 1.0 | 61.75 .30 | 17.9 0.9 |
| 29.7 | 32.96 .55 | 48.9 1.6 | 40.36 .70 | 48.1 1.5 | 60.62 .29 | 41.5 1.2 | 62.06 .30 | 16.9 1.1 |
| May 9.7 | 33.49 .50 | 50.8 2.1 | 41.03 .84 | 49.9 2.0 | 60.91 .28 | 42.8 1.4 | 62.36 .29 | 15.8 1.2 |
| 19.6 | 33.97 .44 | 53.1 2.5 | 41.64 .55 | 52.2 2.5 | 61.19 .27 | 44.3 1.6 | 62.65 .28 | 14.6 1.3 |
| 29.6 | 34.37 +36 | 55.9 +2.9 | 42.14 +45 | 51.8 +2.8 | 61.45 +25 | 45.9 +1.7 | 62.92 +26 | 13.3 +1.3 |
| June 8.6 | 34.70 .98 | 59.0 .3.9 | 42.55 .34 | 57.9 3.1 | 61.69 .29 | 47.6 1.7 | 63.17 .24 | 12.0 1.3 |
| 18.6 | 34.94 .19 | 62.3 3.3 | 42.83 .29 | 61.1 3.3 | 61.89 .19 | 49.3 1.7 | 63.40 .21 | 10.8 1.2 |
| 28.5 | 35.08 +09 | 65.7 3.4 | 42.99 +09 | 64.5 3.4 | 62.06 .15 | 51.0 1.6 | 63.59 .17 | 9.6 1.1 |
| July 8.5 | 35.12 -01 | 69.2 3.4 | 43.02 -03 | 68.0 3.4 | 62.20 .11 | 52.6 1.5 | 63.74 .13 | 8.5 1.0 |
| 18.5 | 35.06 -11 | 72.6 +3.3 | 42.92 -16 | 71.4 +3.3 | 62.29 +07 | 54.0 +1.4 | 63.85 +09 | 7.6 +0.9 |
| 28.4 | 34.91 .20 | 75.9 3.1 | 42.69 .29 | 74.7 3.2 | 62.34 +03 | 55.4 1.2 | 63.92 +04 | 6.8 0.7 |
| Aug. 7.4 | 34.66 .29 | 78.9 2.9 | 42.34 .41 | 77.8 3.0 | 62.34 -02 | 56.5 1.0 | 63.94 .00 | 6.2 0.5 |
| 17.4 | 34.32 .37 | 81.7 2.6 | 41.88 .51 | 80.6 2.7 | 62.31 .06 | 57.5 0.8 | 63.92 -04 | 5.7 0.4 |
| 27.4 | 33.91 .44 | 84.1 2.2 | 41.32 .61 | 83.2 2.3 | 62.23 .09 | 58.2 0.7 | 63.85 .08 | 5.4 0.3 |
| Sept. 6.3 | 33.43 -51 | 86.2 +1.8 | 40.66 -69 | 85.3 +1.9 | 62.12 -12 | 58.8 +0.5 | 63.75 -11 | 5.2 +0.1 |
| 16.3 | 32.89 .55 | 87.8 1.4 | 39.94 .75 | 87.0 1.5 | 61.99 .14 | 59.2 0.3 | 63.63 .14 | 5.2 0.0 |
| 26.3 | 32.32 .58 | 88.9 1.0 | 39.16 .79 | 88.3 1.0 | 61.83 .16 | 59.3 +0.1 | 63.48 .15 | 5.2 -0.1 |
| Oct. 6.3 | 31.72 .60 | 89.5 +0.4 | 38.35 .82 | 89.0 +0.5 | 61.67 .17 | 59.3 -0.1 | 63.32 .16 | 5.4 0.2 |
| 16.2 | 31.12 .60 | 89.6 -0.2 | 37.52 .89 | 89.2 0.0 | 61.50 .16 | 59.0 0.3 | 63.16 .16 | 5.6 0.3 |
| 26.2 | 30.52 -58 | 89.2 -0.7 | 36.71 -80 | 88.9 -0.6 | 61.34 -15 | 58.6 -0.5 | 63.00 -15 | 6.0 -0.4 |
| Nov. 5.2 | 29.96 .54 | 88.1 1.3 | 35.93 .75 | 88.0 1.1 | 61.20 .13 | 58.0 0.7 | 62.87 .13 | 6.5 0.5 |
| 15.1 | 29.44 .49 | 86.6 1.8 | 35.20 .69 | 86.6 1.7 | 61.09 .10 | 57.2 0.9 | 62.75 .10 | 7.0 0.6 |
| 25.1 | 28.98 .42 | 84.5 2.3 | 34.54 .61 | 84.6 2.2 | 61.01 .06 | 56.2 1.1 | 62.67 .07 | 7.6 0.7 |
| Dec. 5.1 | 28.60 .34 | 82.0 2.7 | 33.99 .50 | 82.2 2.6 | 60.96 -02 | 55.0 1.2 | 62.62 -03 | 8.3 0.7 |
| 15.1 | 28.30 -24 | 79.0 -3.1 | 33.54 -38 | 79.3 -3.0 | 60.96 +02 | 53.8 -1.3 | 62.62 +01 | 9.0 -0.8 |
| 25.0 | 28.11 .14 | 75.8 3.3 | 33.22 .25 | 76.1 3.3 | 61.00 .06 | 52.4 1.4 | 62.65 .05 | 9.9 0.8 |
| 35.0 | 28.02 -04 | 72.3 -3.5 | 33.04 -11 | 72.7 -3.5 | 61.07 +10 | 50.9 -1.5 | 62.72 +09 | 10.7 -0.8 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | γ Aquilæ. | | α Aquilæ. (Altaïr.) | | ϵ Draconis. | | β Aquilæ. | |
|------------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 19 41 ^m | + 10° 20' | ^h 19 45 ^m | + 8° 34' | ^h 19 48 ^m | + 69° 59' | ^h 19 49 ^m | + 6° 7' |
| Jan. 0.0 | ^s 2.42 +.05 | 47.6 -1.8 | ^s 25.67 +.04 | 45.4 -1.7 | ^s 28.37 -.20 | 25.7 -3.3 | ^s 55.31 +.05 | 59.6 -1.5 |
| 10.0 | 2.49 .09 | 45.7 1.8 | 25.74 .08 | 43.7 1.7 | 28.23 -.08 | 22.3 3.4 | 55.37 .08 | 58.0 1.6 |
| 20.0 | 2.59 .12 | 43.9 1.7 | 25.84 .12 | 42.0 1.6 | 28.20 +.04 | 18.8 3.5 | 55.47 .12 | 56.5 1.5 |
| 30.0 | 2.73 .15 | 42.2 1.6 | 25.98 .15 | 40.4 1.5 | 28.30 .15 | 15.3 3.4 | 55.61 .15 | 55.0 1.4 |
| Feb. 8.9 | 2.90 .18 | 40.6 1.4 | 26.15 .18 | 38.9 1.3 | 28.51 .97 | 12.0 3.2 | 55.77 .18 | 53.7 1.2 |
| 18.9 | 3.10 +.21 | 39.3 -1.2 | 26.35 +.21 | 37.7 -1.1 | 28.83 +.37 | 8.9 -2.9 | 55.96 +.20 | 52.5 -1.0 |
| 28.9 | 3.32 .24 | 38.2 0.9 | 26.57 .23 | 36.7 0.8 | 29.26 .46 | 6.2 2.5 | 56.18 .23 | 51.7 0.7 |
| Mar. 10.9 | 3.57 .26 | 37.6 0.5 | 26.82 .25 | 36.1 0.5 | 29.76 .54 | 3.9 2.0 | 56.42 .25 | 51.1 -0.4 |
| 20.8 | 3.84 .27 | 37.2 -0.2 | 27.08 .27 | 35.8 -0.1 | 30.34 .60 | 2.3 1.4 | 56.68 .27 | 50.9 0.0 |
| 30.8 | 4.12 .28 | 37.2 +0.2 | 27.36 .28 | 35.9 +0.3 | 30.97 .64 | 1.2 0.7 | 56.96 .28 | 51.0 +0.3 |
| Apr. 9.8 | 4.41 +.29 | 37.7 +0.6 | 27.65 +.29 | 36.4 +0.6 | 31.63 +.66 | 0.8 -0.1 | 57.25 +.29 | 51.5 +0.6 |
| 19.7 | 4.71 .30 | 38.5 1.0 | 27.95 .30 | 37.2 1.0 | 32.29 .66 | 1.1 +0.6 | 57.55 .30 | 52.3 1.0 |
| 29.7 | 5.01 .30 | 39.7 1.3 | 28.25 .30 | 38.4 1.3 | 32.95 .64 | 2.0 1.2 | 57.85 .30 | 53.4 1.3 |
| May 9.7 | 5.30 .29 | 41.1 1.6 | 28.54 .29 | 39.8 1.6 | 33.58 .60 | 3.4 1.7 | 58.14 .29 | 54.8 1.5 |
| 19.7 | 5.59 .28 | 42.8 1.8 | 28.83 .28 | 41.5 1.8 | 34.15 .54 | 5.5 2.2 | 58.43 .28 | 56.4 1.7 |
| 29.6 | 5.85 +.26 | 44.7 +1.9 | 29.10 +.26 | 43.3 +1.9 | 34.66 +.47 | 7.9 +2.6 | 58.71 +.26 | 58.1 +1.8 |
| June 8.6 | 6.10 .23 | 46.7 2.0 | 29.36 .24 | 45.3 2.0 | 35.09 .38 | 10.8 3.0 | 58.96 .24 | 60.0 1.9 |
| 18.6 | 6.32 .20 | 48.8 2.1 | 29.58 .21 | 47.3 2.0 | 35.43 .28 | 14.0 3.3 | 59.19 .21 | 61.9 1.9 |
| 28.6 | 6.50 .17 | 50.9 2.0 | 29.77 .17 | 49.3 2.0 | 35.67 .18 | 17.4 3.4 | 59.39 .18 | 63.8 1.8 |
| July 8.5 | 6.65 .13 | 52.9 1.9 | 29.92 .13 | 51.3 1.9 | 35.80 +.07 | 20.9 3.5 | 59.54 .14 | 65.6 1.7 |
| 18.5 | 6.76 +.08 | 54.8 +1.8 | 30.04 +.09 | 53.1 +1.8 | 35.82 -.05 | 24.4 +3.5 | 59.66 +.09 | 67.3 +1.6 |
| 28.5 | 6.82 +.04 | 56.6 1.7 | 30.10 +.04 | 54.8 1.6 | 35.72 .15 | 27.9 3.4 | 59.73 .05 | 68.9 1.5 |
| Aug. 7.4 | 6.84 .00 | 58.2 1.5 | 30.13 .00 | 56.4 1.4 | 35.52 .25 | 31.2 3.2 | 59.76 +.01 | 70.3 1.3 |
| 17.4 | 6.81 -.05 | 59.6 1.3 | 30.11 -.04 | 57.7 1.2 | 35.22 .35 | 34.3 3.0 | 59.75 -.03 | 71.5 1.1 |
| 27.4 | 6.74 .09 | 60.7 1.0 | 30.04 .06 | 58.8 1.0 | 34.83 .44 | 37.2 2.7 | 59.69 .07 | 72.5 0.9 |
| Sept. 6.4 | 6.64 -.12 | 61.6 +0.8 | 29.95 -.11 | 59.7 +0.8 | 34.35 -.51 | 39.7 +2.3 | 59.60 -.10 | 73.3 +0.6 |
| 16.3 | 6.51 .14 | 62.3 0.5 | 29.82 .14 | 60.3 0.5 | 33.80 .57 | 41.8 1.9 | 59.48 .13 | 73.8 0.4 |
| 26.3 | 6.35 .16 | 62.7 +0.3 | 29.67 .16 | 60.7 +0.3 | 33.20 .62 | 43.5 1.4 | 59.33 .15 | 74.1 +0.2 |
| Oct. 6.3 | 6.19 .17 | 62.9 0.0 | 29.51 .17 | 60.9 0.0 | 32.54 .66 | 44.7 0.9 | 59.17 .16 | 74.2 0.0 |
| 16.3 | 6.02 .17 | 62.8 -0.2 | 29.34 .16 | 60.8 -0.2 | 31.87 .67 | 45.3 +0.4 | 59.01 .16 | 74.0 -0.2 |
| 26.2 | 5.85 -.16 | 62.4 -0.5 | 29.18 -.15 | 60.4 -0.5 | 31.20 -.66 | 45.5 -0.1 | 58.85 -.15 | 73.7 -0.5 |
| Nov. 5.2 | 5.70 .14 | 61.7 0.7 | 29.03 .14 | 59.8 0.7 | 30.54 .64 | 45.0 0.7 | 58.70 .14 | 73.1 0.7 |
| 15.2 | 5.57 .11 | 60.8 1.0 | 28.91 .11 | 59.0 0.9 | 29.92 .60 | 44.0 1.3 | 58.57 .11 | 72.3 0.9 |
| 25.2 | 5.47 .08 | 59.7 1.2 | 28.81 .08 | 57.9 1.1 | 29.34 .54 | 42.5 1.8 | 58.17 .08 | 71.3 1.1 |
| Dec. 5.1 | 5.40 .05 | 58.4 1.4 | 28.74 .05 | 56.7 1.3 | 28.84 .46 | 40.4 2.3 | 58.40 .05 | 70.1 1.3 |
| 15.1 | 5.37 -.01 | 56.9 -1.6 | 28.71 -.02 | 55.2 -1.5 | 28.42 -.37 | 37.9 -2.7 | 58.37 -.01 | 68.8 -1.4 |
| 25.1 | 5.38 +.03 | 55.2 1.7 | 28.72 +.02 | 53.7 1.6 | 28.10 .27 | 34.9 3.1 | 58.38 +.02 | 67.4 1.5 |
| 35.0 | 5.43 +.07 | 53.4 -1.0 | 28.76 +.06 | 52.1 -1.7 | 27.88 -.16 | 31.7 -3.3 | 58.42 +.06 | 65.8 -1.6 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | τ Aquilæ. | | α^2 Capricorni. | | κ Cephei. | | α Pavonis. | |
|------------------------|-----------------------|--------------------------|------------------------|--------------------------|-----------------------|--------------------------|-----------------------|-------------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination South. |
| | ^h 19 58 | ^m + 6° 57' | ^h 20 11 | ^m -12° 52' | ^h 20 12 | ^m +77° 22' | ^h 20 16 | ^m -57° 4' |
| Jan. 0.1 | 46.74 +.04 | 68.6 -1.5 | 58.10 +.04 | 64.7 -0.4 | 27.59 -.48 | 61.0 -3.0 | 58.11 +.02 | 74.1 +2.1 |
| 10.0 | 46.80 .07 | 67.0 1.6 | 58.16 .08 | 65.1 0.4 | 27.20 .30 | 57.8 3.3 | 58.17 .09 | 71.9 2.2 |
| 20.0 | 46.89 .11 | 65.5 1.5 | 58.25 .11 | 65.4 0.3 | 26.99 -.11 | 54.4 3.4 | 58.30 .16 | 69.6 2.3 |
| 30.0 | 47.01 .14 | 64.0 1.4 | 58.38 .14 | 65.7 0.2 | 26.97 +.07 | 51.0 3.4 | 58.49 .22 | 67.3 2.4 |
| Feb. 9.0 | 47.17 .17 | 62.6 1.2 | 58.54 .17 | 65.9 -0.1 | 27.14 .26 | 47.6 3.3 | 58.74 .28 | 64.9 2.3 |
| 18.9 | 47.35 +.20 | 61.5 -1.0 | 58.72 +.23 | 65.9 0.0 | 27.50 +.44 | 44.4 -3.0 | 59.06 +.33 | 62.6 +2.3 |
| 28.9 | 47.56 .22 | 60.6 0.7 | 58.94 .23 | 65.8 +0.2 | 28.03 .60 | 41.5 2.7 | 59.42 .38 | 60.4 2.2 |
| Mar. 10.9 | 47.80 .24 | 60.0 0.4 | 59.18 .25 | 65.4 0.4 | 28.70 .74 | 39.0 2.2 | 59.82 .42 | 58.3 2.0 |
| 20.8 | 48.05 .26 | 59.8 -0.1 | 59.44 .27 | 64.9 0.6 | 29.51 .85 | 37.0 1.7 | 60.26 .46 | 56.4 1.8 |
| 30.8 | 48.33 .28 | 59.9 +0.3 | 59.72 .29 | 64.2 0.8 | 30.41 .97 | 35.6 1.0 | 60.74 .49 | 54.7 1.6 |
| Apr. 9.8 | 48.61 +.29 | 60.4 +0.6 | 60.02 +.30 | 63.4 +0.9 | 31.38 +.98 | 34.9 -0.4 | 61.24 +.51 | 53.2 +1.3 |
| 19.8 | 48.91 .30 | 61.2 1.0 | 60.32 .31 | 62.4 1.1 | 32.37 .29 | 34.7 +0.2 | 61.76 .52 | 52.0 1.0 |
| 29.7 | 49.21 .30 | 62.3 1.3 | 60.64 .32 | 61.2 1.2 | 33.36 .27 | 35.2 0.8 | 62.28 .53 | 51.2 0.7 |
| May 9.7 | 49.51 .29 | 63.7 1.5 | 60.95 .31 | 60.0 1.2 | 34.33 .23 | 36.3 1.4 | 62.82 .52 | 50.6 +0.4 |
| 19.7 | 49.80 .28 | 65.4 1.7 | 61.26 .30 | 58.8 1.3 | 35.22 .25 | 38.0 1.9 | 63.34 .51 | 50.4 0.0 |
| 29.7 | 50.08 +.27 | 67.2 +1.8 | 61.57 +.29 | 57.5 +1.2 | 36.02 +.74 | 40.2 +2.4 | 63.84 +.49 | 50.6 -0.3 |
| June 8.6 | 50.34 .25 | 69.1 1.9 | 61.85 .27 | 56.3 1.2 | 36.70 .21 | 42.8 2.8 | 64.31 .45 | 51.1 0.7 |
| 18.6 | 50.58 .22 | 71.1 2.0 | 62.11 .24 | 55.1 1.1 | 37.25 .42 | 45.8 3.1 | 64.74 .41 | 51.9 1.0 |
| 28.6 | 50.78 .18 | 73.0 1.9 | 62.34 .21 | 54.1 1.0 | 37.65 .31 | 49.0 3.3 | 65.12 .35 | 53.0 1.3 |
| July 8.5 | 50.94 .14 | 74.9 1.8 | 62.53 .17 | 53.2 0.8 | 37.88 +.15 | 52.4 3.4 | 65.44 .28 | 54.5 1.6 |
| 18.5 | 51.07 +.10 | 76.7 +1.7 | 62.69 +.13 | 52.4 +0.7 | 37.95 -.02 | 56.0 +3.5 | 65.69 +.21 | 56.2 -1.8 |
| 28.5 | 51.15 .06 | 78.4 1.5 | 62.80 .08 | 51.9 0.5 | 37.85 .18 | 59.5 3.5 | 65.86 .14 | 58.0 1.9 |
| Aug. 7.5 | 51.18 +.01 | 79.9 1.4 | 62.86 +.04 | 51.5 0.3 | 37.58 .35 | 62.9 3.4 | 65.96 +.06 | 60.1 2.0 |
| 17.4 | 51.18 -.03 | 81.2 1.2 | 62.88 -.01 | 51.2 +0.2 | 37.15 .50 | 66.2 3.2 | 65.98 -.02 | 62.1 2.0 |
| 27.4 | 51.13 .07 | 82.2 1.0 | 62.85 .05 | 51.1 0.0 | 36.57 .64 | 69.3 2.9 | 65.92 .09 | 64.2 2.0 |
| Sept. 6.4 | 51.04 -.10 | 83.1 +0.7 | 62.78 -.08 | 51.2 -0.1 | 35.86 -.77 | 72.2 +2.6 | 65.79 -.16 | 66.1 -1.9 |
| 16.4 | 50.92 .13 | 83.7 0.5 | 62.68 .11 | 51.4 0.2 | 35.03 .88 | 74.6 2.3 | 65.59 .21 | 67.9 1.6 |
| 26.3 | 50.78 .15 | 84.1 +0.3 | 62.55 .14 | 51.6 0.3 | 34.10 .97 | 76.7 1.9 | 65.35 .26 | 69.4 1.3 |
| Oct. 6.3 | 50.62 .16 | 84.2 0.0 | 62.40 .15 | 51.9 0.3 | 33.10 1.03 | 78.4 1.4 | 65.06 .29 | 70.6 1.0 |
| 16.3 | 50.46 .16 | 84.1 -0.2 | 62.25 .16 | 52.3 0.4 | 32.04 1.07 | 79.5 0.9 | 64.76 .31 | 71.4 0.6 |
| 26.2 | 50.30 -.15 | 83.8 -0.4 | 62.09 -.15 | 52.7 -0.4 | 30.95-1.09 | 80.1 +0.3 | 64.45 -.30 | 71.8 -0.2 |
| Nov. 5.2 | 50.15 .14 | 83.3 0.7 | 61.95 .14 | 53.1 0.4 | 29.87 1.06 | 80.1 -0.2 | 64.15 .28 | 71.8 +0.2 |
| 15.2 | 50.02 .12 | 82.5 0.9 | 61.82 .12 | 53.5 0.4 | 28.81 1.02 | 79.6 0.8 | 63.88 .25 | 71.4 0.6 |
| 25.2 | 49.92 .09 | 81.6 1.1 | 61.72 .09 | 54.0 0.4 | 27.81 .25 | 78.5 1.4 | 63.64 .20 | 70.5 1.0 |
| Dec. 5.1 | 49.84 .06 | 80.4 1.2 | 61.65 .05 | 54.4 0.4 | 26.90 .25 | 76.8 1.9 | 63.47 .15 | 69.3 1.4 |
| 15.1 | 49.80 -.02 | 79.1 -1.4 | 61.61 -.02 | 54.8 -0.4 | 26.11 -.73 | 74.7 -2.4 | 63.35 -.08 | 67.7 +1.7 |
| 25.1 | 49.80 +.02 | 77.6 1.5 | 61.61 +.02 | 55.2 0.4 | 25.45 .58 | 72.1 2.8 | 63.30 -.01 | 65.9 2.0 |
| 35.1 | 49.83 +.05 | 76.1 -1.6 | 61.65 +.05 | 55.6 -0.4 | 24.95 -.41 | 69.1 -3.1 | 63.32 +.05 | 63.8 +2.2 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | γ Cygni. | | π Capricorni. | | ϵ Delphini. | | Groombridge 3241. | |
|------------------------|---------------------------------------|-----------------------|---------------------------------------|-----------------------|---------------------------------------|-----------------------|---------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 20 ^m 18 | +39° 54' | ^h 20 ^m 21 | -18° 34' | ^h 20 ^m 27 | +10° 55' | ^h 20 ^m 30 | +72° 9' |
| Jan. 0.1 | 16.74 ^s -0.4 | 27.5 -2.7 | 2.60 ^s +0.4 | 16.8 -0.1 | 58.21 .00 | 54.3 -1.6 | 24.32 -3.35 | 47.7 -3.0 |
| 10.0 | 16.72 +.01 | 24.7 2.9 | 2.65 .07 | 16.9 0.0 | 58.23 +.04 | 52.6 1.7 | 24.03 .33 | 44.6 3.2 |
| 20.0 | 16.75 .05 | 21.7 3.0 | 2.74 .10 | 16.8 +0.1 | 58.29 .07 | 51.0 1.6 | 23.86 -1.10 | 41.3 3.4 |
| 30.0 | 16.82 .10 | 18.8 2.9 | 2.86 .14 | 16.7 0.2 | 58.38 .11 | 49.3 1.5 | 23.82 +.03 | 37.8 3.4 |
| Feb. 9.0 | 16.95 .14 | 16.0 2.7 | 3.02 .17 | 16.5 0.3 | 58.51 .14 | 47.8 1.4 | 23.92 .16 | 34.4 3.3 |
| 18.9 | 17.11 +.18 | 13.4 -2.4 | 3.20 +.20 | 16.1 +0.4 | 58.66 +.17 | 46.5 -1.2 | 24.14 +.29 | 31.2 -3.1 |
| 28.9 | 17.32 .23 | 11.1 2.0 | 3.42 .23 | 15.7 0.5 | 58.85 .20 | 45.5 0.9 | 24.49 .40 | 28.2 2.8 |
| Mar. 10.9 | 17.57 .26 | 9.3 1.6 | 3.66 .25 | 15.0 0.7 | 59.06 .23 | 44.7 0.6 | 24.95 .51 | 25.6 2.3 |
| 20.9 | 17.85 .29 | 7.9 1.1 | 3.92 .27 | 14.3 0.8 | 59.30 .25 | 44.3 -0.2 | 25.51 .59 | 23.5 1.8 |
| 30.8 | 18.16 .32 | 7.1 -0.5 | 4.20 .29 | 13.4 0.9 | 59.56 .27 | 44.3 +0.2 | 26.15 .66 | 22.0 1.2 |
| Apr. 9.8 | 18.49 +.34 | 6.9 0.0 | 4.50 +.31 | 12.4 +1.0 | 59.84 +.28 | 44.7 +0.5 | 26.84 +.71 | 21.0 -0.6 |
| 19.8 | 18.83 .35 | 7.2 +0.6 | 4.82 .32 | 11.3 1.1 | 60.13 .29 | 45.4 0.9 | 27.57 .73 | 20.8 0.0 |
| 29.7 | 19.18 .35 | 8.1 1.1 | 5.14 .33 | 10.1 1.2 | 60.43 .30 | 46.6 1.3 | 28.30 .73 | 21.1 +0.6 |
| May 9.7 | 19.53 .34 | 9.5 1.6 | 5.47 .32 | 8.9 1.2 | 60.74 .30 | 48.0 1.6 | 29.03 .71 | 22.1 1.2 |
| 19.7 | 19.87 .33 | 11.4 2.1 | 5.79 .32 | 7.8 1.2 | 61.04 .30 | 49.7 1.8 | 29.72 .66 | 23.6 1.8 |
| 29.7 | 20.19 +.31 | 13.7 +2.5 | 6.11 +.31 | 6.6 +1.1 | 61.33 +.28 | 51.6 +2.0 | 30.35 +.60 | 25.7 +2.3 |
| June 8.6 | 20.48 .28 | 16.4 2.8 | 6.40 .29 | 5.5 1.0 | 61.61 .26 | 53.6 2.1 | 30.91 .51 | 26.2 2.7 |
| 18.6 | 20.74 .24 | 19.3 3.0 | 6.68 .26 | 4.6 0.9 | 61.86 .24 | 55.8 2.2 | 31.38 .42 | 31.2 3.1 |
| 28.6 | 20.96 .19 | 22.3 3.1 | 6.92 .23 | 3.8 0.7 | 62.08 .21 | 58.0 2.2 | 31.75 .31 | 34.4 3.3 |
| July 8.6 | 21.13 .15 | 25.5 3.2 | 7.13 .19 | 3.2 0.5 | 62.27 .17 | 60.1 2.1 | 32.00 .20 | 37.8 3.5 |
| 18.5 | 21.25 +.10 | 28.7 +3.1 | 7.30 +.14 | 2.7 +0.3 | 62.42 +.13 | 62.2 +2.0 | 32.14 +.08 | 41.4 +3.6 |
| 28.5 | 21.32 +.04 | 31.8 3.0 | 7.42 .10 | 2.4 +0.2 | 62.52 .08 | 64.2 1.9 | 32.16 -0.4 | 45.0 3.6 |
| Aug. 7.5 | 21.34 -0.1 | 34.8 2.9 | 7.50 +.05 | 2.4 0.0 | 62.58 +.04 | 65.9 1.7 | 32.05 .16 | 48.5 3.5 |
| 17.4 | 21.30 .07 | 37.5 2.7 | 7.52 .00 | 2.4 -0.1 | 62.60 .00 | 67.5 1.5 | 31.83 .29 | 51.9 3.3 |
| 27.4 | 21.21 .11 | 40.1 2.4 | 7.50 -0.4 | 2.6 0.3 | 62.57 -0.05 | 68.9 1.2 | 31.49 .39 | 55.2 3.1 |
| Sept. 6.4 | 21.08 -0.15 | 42.3 +2.0 | 7.44 -0.08 | 3.0 -0.4 | 62.50 -0.08 | 70.0 +1.0 | 31.06 -0.48 | 58.2 +2.8 |
| 16.4 | 20.91 .19 | 44.2 1.7 | 7.35 .11 | 3.4 0.4 | 62.40 .11 | 70.9 0.7 | 30.53 .56 | 60.8 2.5 |
| 26.3 | 20.70 .22 | 45.7 1.3 | 7.22 .13 | 3.8 0.5 | 62.28 .14 | 71.5 0.5 | 29.93 .64 | 63.1 2.1 |
| Oct. 6.3 | 20.47 .23 | 46.8 0.8 | 7.08 .15 | 4.3 0.5 | 62.13 .15 | 71.8 +0.2 | 29.26 .69 | 64.9 1.6 |
| 16.3 | 20.24 .24 | 47.4 +0.4 | 6.92 .16 | 4.8 0.5 | 61.97 .16 | 71.9 0.0 | 28.55 .72 | 66.2 1.1 |
| 26.2 | 19.99 -0.24 | 47.5 -0.1 | 6.76 -0.15 | 5.2 -0.4 | 61.81 -0.16 | 71.8 -0.3 | 27.81 -0.74 | 67.0 +0.5 |
| Nov. 5.2 | 19.75 .23 | 47.2 0.6 | 6.61 .14 | 5.7 0.4 | 61.65 .15 | 71.4 0.5 | 27.07 .73 | 67.3 0.0 |
| 15.2 | 19.53 .21 | 46.4 1.0 | 6.48 .12 | 6.0 0.3 | 61.51 .13 | 70.7 0.8 | 26.35 .71 | 67.0 -0.6 |
| 25.2 | 19.34 .18 | 45.2 1.5 | 6.37 .09 | 6.3 0.3 | 61.39 .11 | 69.8 1.0 | 25.65 .66 | 66.1 1.2 |
| Dec. 5.1 | 19.17 .15 | 43.4 1.9 | 6.29 .06 | 6.6 0.2 | 61.30 .08 | 68.6 1.2 | 25.02 .60 | 64.6 1.7 |
| 15.1 | 19.04 -0.11 | 41.4 -2.2 | 6.25 -0.02 | 6.7 -0.1 | 61.24 -0.05 | 67.3 -1.4 | 24.46 -0.52 | 63.6 -2.2 |
| 25.1 | 18.95 .06 | 38.9 2.5 | 6.24 +0.1 | 6.8 -0.1 | 61.21 -0.01 | 65.8 1.5 | 23.98 .42 | 60.2 2.6 |
| 35.1 | 18.90 -0.02 | 36.2 -2.8 | 6.27 +0.05 | 6.9 0.0 | 61.21 +0.02 | 64.2 -1.6 | 23.62 -0.30 | 57.3 -3.0 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Cygni. | | μ Aquarii. | | 12 Year Cat. 1879. | | ν Cygni. | |
|------------------------|------------------------------------|---------------------------|------------------------------------|---------------------------|------------------------------------|---------------------------|------------------------------------|---------------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h ^m 20 37 | +44° 53' | ^h ^m 20 46 | — 9° 23' | ^h ^m 20 52 | +80° 8' | ^h ^m 20 53 | +40° 44' |
| Jan. 0.1 | ^s 40.58 —.08 | ["] 27.8 —2.7 | ^s 44.32 +.01 | ["] 40.4 —0.5 | ^s 24.72— .83 | ["] 40.5 —2.6 | ^s 4.28 —.08 | ["] 52.0 —2.5 |
| 10.1 | 40.52 —.03 | 25.0 2.9 | 44.34 .04 | 41.0 0.5 | 24.00 .61 | 37.7 3.0 | 4.23 —.03 | 49.3 2.7 |
| 20.0 | 40.52 +.02 | 22.0 3.0 | 44.40 .07 | 41.4 0.4 | 23.49 .39 | 34.6 3.2 | 4.21 +.01 | 46.5 2.8 |
| 30.0 | 40.56 .07 | 18.9 3.0 | 44.49 .10 | 41.8 0.3 | 23.22— .15 | 31.2 3.3 | 4.24 .05 | 43.6 2.8 |
| Feb. 9.0 | 40.66 .12 | 16.0 2.9 | 44.61 .13 | 42.1 —0.2 | 23.19+ .10 | 27.9 3.3 | 4.32 .10 | 40.8 2.7 |
| 19.0 | 40.81 +.17 | 13.2 —2.6 | 44.76 +.16 | 42.2 0.0 | 23.41+ .33 | 24.6 —3.2 | 4.45 +.15 | 38.2 —2.5 |
| 28.9 | 41.00 .21 | 10.7 2.3 | 44.94 .19 | 42.1 +0.2 | 23.86 .56 | 21.4 3.0 | 4.62 .19 | 35.8 2.2 |
| Mar. 10.9 | 41.24 .26 | 8.6 1.9 | 45.15 .22 | 41.8 0.4 | 24.53 .76 | 18.7 2.6 | 4.83 .23 | 33.8 1.8 |
| 20.9 | 41.52 .30 | 7.0 1.4 | 45.38 .24 | 41.3 0.6 | 25.38 .94 | 16.3 2.1 | 5.08 .27 | 32.2 1.3 |
| 30.8 | 41.83 .33 | 5.9 0.8 | 45.64 .26 | 40.6 0.8 | 26.40 1.08 | 14.4 1.6 | 5.37 .30 | 31.1 0.8 |
| Apr. 9.8 | 42.17 +.35 | 5.4 —0.2 | 45.91 +.28 | 39.7 +1.0 | 27.54+1.17 | 13.1 —1.0 | 5.68 +.32 | 30.6 —0.2 |
| 19.8 | 42.53 .37 | 5.5 +0.4 | 46.21 .30 | 38.6 1.2 | 28.75 1.23 | 12.5 —0.3 | 6.02 .34 | 30.6 +0.3 |
| 29.8 | 42.90 .37 | 6.2 0.9 | 46.51 .31 | 37.3 1.3 | 30.00 1.24 | 12.4 +0.3 | 6.37 .36 | 31.3 0.9 |
| May 9.7 | 43.27 .37 | 7.4 1.5 | 46.83 .31 | 35.9 1.4 | 31.24 1.22 | 13.0 0.9 | 6.73 .36 | 32.4 1.4 |
| 19.7 | 43.64 .36 | 9.1 2.0 | 47.14 .31 | 34.4 1.5 | 32.44 1.15 | 14.2 1.4 | 7.09 .35 | 34.1 1.8 |
| 29.7 | 43.99 +.33 | 11.3 +2.4 | 47.45 +.30 | 32.9 +1.5 | 33.54+1.05 | 15.9 +1.9 | 7.43 +.33 | 36.2 +2.3 |
| June 8.6 | 44.31 .30 | 13.9 2.7 | 47.75 .29 | 31.4 1.5 | 34.54 .91 | 18.1 2.4 | 7.75 .31 | 38.6 2.6 |
| 18.6 | 44.60 .26 | 16.8 3.0 | 48.03 .27 | 29.9 1.4 | 35.38 .75 | 20.8 2.8 | 8.04 .28 | 41.4 2.9 |
| 28.6 | 44.84 .22 | 19.9 3.2 | 48.28 .24 | 28.6 1.3 | 36.04 .57 | 23.8 3.1 | 8.30 .24 | 44.4 3.1 |
| July 8.6 | 45.04 .17 | 23.2 3.3 | 48.50 .20 | 27.4 1.2 | 36.52 .38 | 27.0 3.3 | 8.51 .19 | 47.6 3.2 |
| 18.5 | 45.18 +.12 | 26.5 +3.3 | 48.68 +.16 | 26.3 +1.0 | 36.80+ .17 | 30.5 +3.5 | 8.68 +.14 | 50.8 +3.2 |
| 28.5 | 45.27 +.06 | 29.8 3.2 | 48.82 .11 | 25.4 0.8 | 36.87— .03 | 34.0 3.6 | 8.79 .09 | 54.0 3.1 |
| Aug. 7.5 | 45.30 .00 | 33.0 3.1 | 48.91 .07 | 24.7 0.6 | 36.73 .24 | 37.6 3.6 | 8.85 +.03 | 57.1 3.0 |
| 17.5 | 45.28 —.05 | 36.0 2.9 | 48.95 +.02 | 24.2 0.4 | 36.38 .44 | 41.2 3.5 | 8.85 —.02 | 60.1 2.9 |
| 27.4 | 45.20 .10 | 38.8 2.7 | 48.96 —.02 | 23.9 0.2 | 35.84 .63 | 44.6 3.3 | 8.80 .07 | 62.8 2.6 |
| Sept. 6.4 | 45.07 —.15 | 41.3 +2.4 | 48.92 —.06 | 23.7 +0.1 | 35.11— .81 | 47.8 +3.1 | 8.70 —.12 | 65.4 +2.3 |
| 16.4 | 44.89 .19 | 43.5 2.0 | 48.84 .09 | 23.8 —0.1 | 34.22 .97 | 50.8 2.8 | 8.56 .16 | 67.5 2.0 |
| 26.3 | 44.68 .22 | 45.3 1.6 | 48.74 .11 | 23.9 0.2 | 33.18 1.10 | 53.4 2.4 | 8.39 .19 | 69.4 1.6 |
| Oct. 6.3 | 44.44 .24 | 46.7 1.9 | 48.61 .13 | 24.2 0.3 | 32.01 1.22 | 55.6 2.0 | 8.18 .21 | 70.8 1.2 |
| 16.3 | 44.19 .26 | 47.7 0.7 | 48.47 .14 | 24.5 0.4 | 30.74 1.30 | 57.4 1.5 | 7.96 .23 | 71.8 0.8 |
| 26.3 | 43.92 —.26 | 48.1 +0.2 | 48.32 —.15 | 24.9 —0.4 | 29.41—1.35 | 58.7 +1.0 | 7.72 —.24 | 72.4 +0.3 |
| Nov. 5.2 | 43.66 .23 | 48.1 —0.2 | 48.17 .14 | 25.4 0.5 | 28.04 1.37 | 59.4 +0.4 | 7.49 .23 | 72.4 —0.2 |
| 15.2 | 43.41 .24 | 47.6 0.7 | 48.04 .12 | 25.9 0.5 | 26.67 1.36 | 59.6 —0.1 | 7.26 .22 | 72.0 0.7 |
| 25.2 | 43.18 .22 | 46.5 1.3 | 47.93 .10 | 26.4 0.5 | 25.32 1.31 | 59.1 0.7 | 7.05 .20 | 71.2 1.1 |
| Dec. 5.2 | 42.97 .19 | 45.0 1.7 | 47.84 .07 | 27.0 0.6 | 24.05 1.22 | 58.1 1.3 | 6.86 .17 | 69.8 1.5 |
| 15.1 | 42.80 —.15 | 43.1 —2.1 | 47.78 —.04 | 27.6 —0.6 | 22.89—1.09 | 56.6 —1.8 | 6.71 —.14 | 68.1 —1.9 |
| 25.1 | 42.68 .10 | 40.7 2.5 | 47.75 —.01 | 28.1 0.6 | 21.87 .93 | 54.5 2.3 | 6.58 .10 | 65.9 2.3 |
| 35.1 | 42.59 —.06 | 38.0 —2.8 | 47.76 +.02 | 28.6 —0.5 | 21.02— .74 | 51.9 —2.8 | 6.50 —.06 | 63.5 —2.6 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | 61 ¹ Cygni. | | ζ Cygni. | | α Cephei. | | 1 Pegasi. | |
|------------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 21 | ^m 1 | ^h 21 | ^m 8 | ^h 21 | ^m 15 | ^h 21 | ^m 17 |
| | | +38° 12' | | +29° 46' | | +62° 7' | | +19° 20' |
| Jan. 0.1 | ^s 58.43 | -.07 | ^s 15.68 | -.06 | ^s 55.79 | -.25 | ^s 0.68 | -.05 |
| 10.1 | 58.38 | -.03 | 15.64 | -.02 | 55.57 | .18 | 0.65 | -.01 |
| 20.0 | 58.37 | +.01 | 15.64 | +.01 | 55.42 | .11 | 0.65 | +.02 |
| 30.0 | 58.40 | .06 | 15.67 | .05 | 55.35 | -.03 | 0.69 | .05 |
| Feb. 9.0 | 58.48 | .10 | 15.74 | .09 | 55.36 | +.05 | 0.76 | .09 |
| 19.0 | 58.61 | +.14 | 15.85 | +.13 | 55.45 | +.13 | 0.86 | +.12 |
| 28.9 | 58.77 | .18 | 15.99 | .17 | 55.62 | .21 | 1.00 | .15 |
| Mar. 10.9 | 58.98 | .22 | 16.18 | .20 | 55.87 | .29 | 1.17 | .19 |
| 20.9 | 59.23 | .26 | 16.40 | .23 | 56.19 | .35 | 1.38 | .22 |
| 30.9 | 59.51 | .30 | 16.65 | .26 | 56.58 | .41 | 1.61 | .25 |
| Apr. 9.8 | 59.82 | +.32 | 16.93 | +.29 | 57.02 | +.46 | 1.87 | +.27 |
| 19.8 | 60.16 | .34 | 17.23 | .31 | 57.50 | .49 | 2.15 | .29 |
| 29.8 | 60.51 | .35 | 17.54 | .32 | 58.00 | .51 | 2.45 | .30 |
| May 9.7 | 60.87 | .36 | 17.87 | .33 | 58.52 | .52 | 2.76 | .31 |
| 19.7 | 61.23 | .35 | 18.20 | .33 | 59.04 | .51 | 3.08 | .31 |
| 29.7 | 61.58 | +.34 | 18.52 | +.32 | 59.53 | +.48 | 3.39 | +.30 |
| June 8.7 | 61.91 | .32 | 18.83 | .30 | 60.00 | .44 | 3.70 | .29 |
| 18.6 | 62.21 | .29 | 19.12 | .27 | 60.42 | .39 | 3.98 | .27 |
| 28.6 | 62.48 | .25 | 19.38 | .24 | 60.78 | .33 | 4.24 | .24 |
| July 8.6 | 62.71 | .21 | 19.60 | .20 | 61.08 | .26 | 4.47 | .21 |
| 18.6 | 62.90 | +.16 | 19.78 | +.16 | 61.31 | +.19 | 4.66 | +.17 |
| 28.5 | 63.03 | .11 | 19.92 | .11 | 61.46 | .11 | 4.80 | .13 |
| Aug. 7.5 | 63.11 | +.06 | 20.00 | .06 | 61.52 | +.03 | 4.91 | .08 |
| 17.5 | 63.14 | .00 | 20.04 | +.01 | 61.51 | -.03 | 4.96 | +.03 |
| 27.4 | 63.12 | -.05 | 20.03 | -.03 | 61.41 | .13 | 4.98 | -.01 |
| Sept. 6.4 | 63.05 | -.09 | 19.98 | -.07 | 61.25 | -.20 | 4.94 | -.05 |
| 16.4 | 62.94 | .13 | 19.88 | .11 | 61.01 | .26 | 4.88 | .09 |
| 26.4 | 62.79 | .16 | 19.75 | .14 | 60.71 | .32 | 4.77 | .12 |
| Oct. 6.3 | 62.61 | .19 | 19.60 | .16 | 60.37 | .37 | 4.64 | .14 |
| 16.3 | 62.41 | .20 | 19.42 | .18 | 60.08 | .40 | 4.50 | .15 |
| 26.3 | 62.20 | -.21 | 19.24 | -.19 | 59.57 | -.42 | 4.34 | -.16 |
| Nov. 5.3 | 61.99 | .21 | 19.05 | .18 | 59.14 | .43 | 4.18 | .16 |
| 15.2 | 61.79 | .20 | 18.87 | .17 | 58.71 | .42 | 4.03 | .15 |
| 25.2 | 61.60 | .18 | 18.70 | .16 | 58.29 | .41 | 3.89 | .13 |
| Dec. 5.2 | 61.43 | .15 | 18.55 | .14 | 57.89 | .38 | 3.76 | .11 |
| 15.1 | 61.29 | -.12 | 18.43 | -.11 | 57.53 | -.34 | 3.66 | -.09 |
| 25.1 | 61.18 | .09 | 18.34 | .08 | 57.22 | .29 | 3.50 | .06 |
| 35.1 | 61.11 | -.05 | 18.28 | -.04 | 56.96 | -.23 | 3.54 | -.03 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | β Aquarii. | | β Cephei. | | ξ Aquarii. | | ϵ Pegasi. | |
|------------------------|------------------------------------|------------------------|------------------------------------|------------------------|------------------------------------|------------------------|------------------------------------|------------------------|
| | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. |
| | ^h ^m 21 25 | — ° ′ 6 2 | ^h ^m 21 27 | + ° ′ 70 4 | ^h ^m 21 31 | — ° ′ 8 20 | ^h ^m 21 38 | + ° ′ 9 22 |
| Jan. 0.1 | 47.26 ^s -.03 | 71.0 ^s -0.7 | 11.58 ^s -.42 | 61.9 ^s -2.4 | 55.00 ^s -.03 | 44.0 ^s -0.5 | 48.05 ^s -.05 | 26.1 ^s -1.3 |
| 10.1 | 47.24 .00 | 71.6 0.6 | 11.21 .33 | 59.4 2.7 | 54.99 .00 | 44.5 0.5 | 48.02 ^s -.02 | 24.8 1.3 |
| 20.1 | 47.26 +.03 | 72.2 0.5 | 10.93 .22 | 56.4 3.0 | 55.00 +.03 | 44.9 0.4 | 48.01 +.01 | 23.5 1.3 |
| 30.0 | 47.31 .06 | 72.7 0.4 | 10.76 ^s -.12 | 53.2 3.2 | 55.04 .06 | 45.2 0.3 | 48.03 .04 | 22.2 1.2 |
| Feb. 9.0 | 47.39 .09 | 73.0 0.3 | 10.70 .00 | 49.9 3.3 | 55.12 .09 | 45.4 ^s -0.1 | 48.09 .07 | 20.9 1.1 |
| 19.0 | 47.50 +.12 | 73.2 ^s -0.1 | 10.75 +.11 | 46.6 ^s -3.2 | 55.22 +.12 | 45.5 +.01 | 48.18 +.10 | 19.8 ^s -1.0 |
| 28.9 | 47.64 .15 | 73.2 +.01 | 10.92 .23 | 43.5 3.0 | 55.36 .15 | 45.3 0.3 | 48.30 .13 | 18.9 0.7 |
| Mar. 10.9 | 47.81 .18 | 73.0 0.3 | 11.21 .34 | 40.6 2.7 | 55.52 .16 | 45.0 0.5 | 48.45 .17 | 18.3 0.5 |
| 20.9 | 48.01 .21 | 72.6 0.5 | 11.60 .44 | 38.0 2.3 | 55.72 .21 | 44.4 0.7 | 48.63 .20 | 18.0 ^s -0.2 |
| 30.9 | 48.23 .24 | 71.8 0.8 | 12.08 .52 | 36.0 1.8 | 55.94 .24 | 43.6 0.9 | 48.84 .23 | 18.0 +.02 |
| Apr. 9.8 | 48.48 +.26 | 70.9 +.10 | 12.64 +.59 | 34.5 ^s -1.2 | 56.19 +.26 | 42.6 +.11 | 49.06 +.25 | 18.3 +.05 |
| 19.8 | 48.76 .28 | 69.8 1.2 | 13.26 .64 | 33.5 ^s -0.6 | 56.46 .28 | 41.3 1.3 | 49.35 .28 | 19.0 0.9 |
| 29.8 | 49.05 .30 | 68.4 1.4 | 13.91 .86 | 33.2 0.0 | 56.76 .30 | 39.9 1.5 | 49.64 .30 | 20.1 1.2 |
| May 9.8 | 49.36 .31 | 66.9 1.6 | 14.59 .67 | 33.5 +.06 | 57.06 .31 | 38.4 1.6 | 49.94 .31 | 21.4 1.5 |
| 19.7 | 49.67 .31 | 65.3 1.7 | 15.26 .66 | 34.4 1.2 | 57.38 .32 | 36.7 1.7 | 50.25 .31 | 23.1 1.7 |
| 29.7 | 49.99 +.31 | 63.6 +.17 | 15.91 +.63 | 36.0 +.18 | 57.70 +.32 | 35.0 +.17 | 50.56 +.31 | 24.9 +.19 |
| June 8.7 | 50.30 .30 | 61.8 1.7 | 16.52 .58 | 38.0 2.3 | 58.01 .31 | 33.3 1.7 | 50.87 .30 | 27.0 2.1 |
| 18.6 | 50.59 .28 | 60.1 1.7 | 17.07 .51 | 40.5 2.7 | 58.31 .29 | 31.6 1.8 | 51.16 .28 | 29.1 2.2 |
| 28.6 | 50.86 .26 | 58.4 1.6 | 17.55 .43 | 43.4 3.0 | 58.59 .27 | 30.0 1.5 | 51.43 .26 | 31.3 2.2 |
| July 8.6 | 51.11 .23 | 56.9 1.5 | 17.94 .34 | 46.6 3.3 | 58.84 .23 | 28.6 1.4 | 51.68 .23 | 33.4 2.1 |
| 18.6 | 51.32 +.19 | 55.5 +.13 | 18.23 +.24 | 50.1 +.35 | 59.06 +.20 | 27.3 +.12 | 51.89 +.19 | 35.6 +.20 |
| 28.5 | 51.49 .15 | 54.4 1.1 | 18.42 .14 | 53.7 3.6 | 59.23 .16 | 26.2 1.0 | 52.06 .15 | 37.6 1.9 |
| Aug. 7.5 | 51.62 .10 | 53.4 0.9 | 18.51 +.03 | 57.4 3.7 | 59.37 .11 | 25.4 0.8 | 52.19 .11 | 39.5 1.8 |
| 17.5 | 51.70 .06 | 52.6 0.7 | 18.48 ^s -0.7 | 61.0 3.6 | 59.46 .06 | 24.7 0.5 | 52.28 .06 | 41.2 1.6 |
| 27.5 | 51.74 +.02 | 52.0 0.5 | 18.35 .18 | 64.6 3.5 | 59.50 +.02 | 24.2 0.3 | 52.32 +.02 | 42.6 1.4 |
| Sept. 6.4 | 51.73 ^s -.02 | 51.6 +.03 | 18.12 ^s -2.7 | 68.0 +.33 | 59.51 ^s -.02 | 24.0 +.01 | 52.32 ^s -.02 | 43.9 +.11 |
| 16.4 | 51.69 .06 | 51.4 +.01 | 17.80 .36 | 71.2 3.0 | 59.47 .06 | 23.9 0.0 | 52.28 .06 | 44.9 0.9 |
| 26.4 | 51.61 .09 | 51.4 ^s -0.1 | 17.40 .44 | 74.1 2.7 | 59.40 .09 | 24.0 ^s -0.2 | 52.20 .09 | 45.7 0.6 |
| Oct. 6.3 | 51.51 .11 | 51.6 0.2 | 16.92 .51 | 76.6 2.3 | 59.30 .11 | 24.3 0.3 | 52.10 .11 | 46.3 0.4 |
| 16.3 | 51.38 .13 | 51.9 0.3 | 16.38 .56 | 78.7 1.8 | 59.18 .13 | 24.6 0.4 | 51.98 .13 | 46.6 +.02 |
| 26.3 | 51.25 ^s -1.4 | 52.2 ^s -0.4 | 15.80 ^s -6.0 | 80.3 +.14 | 59.04 ^s -1.3 | 25.1 ^s -0.5 | 51.85 ^s -1.4 | 46.6 0.0 |
| Nov. 5.3 | 51.11 .13 | 52.7 0.5 | 15.19 .62 | 81.4 0.8 | 58.91 .13 | 25.6 0.5 | 51.71 .14 | 46.4 ^s -0.3 |
| 15.2 | 50.98 .12 | 53.2 0.6 | 14.56 .62 | 82.0 +.02 | 58.78 .12 | 26.1 0.6 | 51.57 .13 | 46.0 0.5 |
| 25.2 | 50.86 .11 | 53.8 0.6 | 13.95 .61 | 81.9 ^s -0.3 | 58.66 .11 | 26.7 0.6 | 51.44 .12 | 45.4 0.7 |
| Dec. 5.2 | 50.76 .09 | 54.5 0.6 | 13.35 .58 | 81.2 0.9 | 58.55 .09 | 27.3 0.6 | 51.33 .10 | 44.6 0.9 |
| 15.2 | 50.68 ^s -0.7 | 55.1 ^s -0.6 | 12.80 ^s -5.3 | 80.0 ^s -1.5 | 58.47 ^s -0.7 | 27.9 ^s -0.6 | 51.23 ^s -0.8 | 43.7 ^s -1.1 |
| 25.1 | 50.62 .04 | 55.8 0.6 | 12.30 .46 | 78.2 2.0 | 58.41 .04 | 28.4 0.6 | 51.16 .06 | 42.5 1.2 |
| 35.1 | 50.59 ^s -0.1 | 56.4 ^s -0.6 | 11.87 ^s -3.8 | 75.9 ^s -2.5 | 58.38 ^s -0.2 | 29.0 ^s -0.5 | 51.11 ^s -0.4 | 41.3 ^s -1.3 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | 11 Cephei. | | μ Capricorni. | | 79 Draconis. | | α Aquarii. | |
|------------------------|---------------------------------------|-----------------------|---------------------------------------|-----------------------|---------------------------------------|-----------------------|--------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination South. |
| | ^h 21 ^m 40 | +70° 48' | ^h 21 ^m 47 | -14° 3' | ^h 21 ^m 51 | +73° 10' | ^h 22 ^m 0 | - 0° 50' |
| Jan. 0.1 | 16.02 -46 | 41.4 -2.9 | 19.26 -04 | 64.4 -0.3 | 26.61 -56 | 79.7 -2.1 | 9.30 -05 | 65.5 0.8 |
| 10.1 | 15.60 .37 | 39.0 2.6 | 19.23 -01 | 64.6 -0.1 | 26.09 .46 | 77.4 2.5 | 9.25 -03 | 66.3 0.8 |
| 20.1 | 15.28 .27 | 36.2 2.9 | 19.23 +02 | 61.7 0.0 | 25.68 .35 | 74.7 2.9 | 9.24 .00 | 67.0 0.7 |
| 30.0 | 15.06 .16 | 33.1 3.2 | 19.26 .05 | 64.6 +0.1 | 25.38 .23 | 71.7 3.1 | 9.25 +03 | 67.8 0.6 |
| Feb. 9.0 | 14.96 -04 | 29.8 3.3 | 19.32 .08 | 64.5 0.2 | 25.22 -10 | 68.5 3.2 | 9.29 .06 | 68.3 0.5 |
| 19.0 | 14.98 +08 | 26.6 -3.2 | 19.42 +11 | 64.1 +0.4 | 25.19 +04 | 65.2 -3.2 | 9.36 +09 | 68.8 -0.3 |
| Mar. 1.0 | 15.12 .20 | 23.4 3.1 | 19.54 .14 | 63.6 0.6 | 25.30 .18 | 62.0 3.1 | 9.46 .12 | 69.0 0.1 |
| 10.9 | 15.38 .31 | 20.4 2.8 | 19.69 .17 | 62.8 0.8 | 25.56 .31 | 59.0 2.9 | 9.60 .15 | 69.0 +0.1 |
| 20.9 | 15.75 .42 | 17.8 2.4 | 19.88 .20 | 61.9 1.0 | 25.93 .44 | 56.2 2.5 | 9.76 .17 | 68.8 0.4 |
| 30.9 | 16.22 .51 | 15.6 1.9 | 20.10 .23 | 60.8 1.2 | 26.43 .55 | 53.9 2.1 | 9.96 .21 | 68.3 0.6 |
| Apr. 9.9 | 16.78 +59 | 13.9 -1.4 | 20.34 +26 | 59.5 +1.4 | 27.03 +64 | 52.1 -1.6 | 10.19 +24 | 67.5 +0.9 |
| 19.8 | 17.40 .65 | 12.8 0.8 | 20.61 .28 | 58.0 1.5 | 27.71 .71 | 50.9 1.0 | 10.44 .27 | 66.5 1.2 |
| 29.8 | 18.07 .68 | 12.4 -0.1 | 20.91 .30 | 56.5 1.6 | 28.45 .75 | 50.2 -0.3 | 10.72 .29 | 65.2 1.4 |
| May 9.8 | 18.76 .70 | 12.5 +0.5 | 21.22 .31 | 54.8 1.7 | 29.22 .78 | 50.2 +0.3 | 11.01 .30 | 63.6 1.6 |
| 19.7 | 19.46 .69 | 13.3 1.0 | 21.54 .32 | 53.1 1.7 | 30.01 .78 | 50.7 0.9 | 11.32 .31 | 62.0 1.8 |
| 29.7 | 20.14 +66 | 14.6 +1.6 | 21.86 +33 | 51.4 +1.7 | 30.78 +75 | 51.9 +1.4 | 11.64 +31 | 60.1 +1.9 |
| June 8.7 | 20.79 .62 | 16.5 2.1 | 22.19 .32 | 49.7 1.6 | 31.51 .70 | 53.6 1.9 | 11.95 .31 | 58.2 1.9 |
| 18.7 | 21.38 .56 | 18.9 2.6 | 22.50 .30 | 48.1 1.5 | 32.18 .64 | 55.9 2.4 | 12.26 .30 | 56.3 1.9 |
| 28.6 | 21.90 .47 | 21.7 3.0 | 22.79 .28 | 46.7 1.3 | 32.78 .55 | 58.5 2.8 | 12.54 .28 | 54.4 1.9 |
| July 8.6 | 22.33 .38 | 24.8 3.3 | 23.06 .25 | 45.5 1.1 | 33.29 .45 | 61.6 3.2 | 12.81 .25 | 52.5 1.3 |
| 18.6 | 22.66 +28 | 28.2 +3.5 | 23.30 +21 | 44.4 +0.9 | 33.69 +34 | 64.9 +3.4 | 13.04 +21 | 50.8 +1.6 |
| 28.6 | 22.90 .18 | 31.8 3.6 | 23.49 .17 | 43.6 0.7 | 33.97 .22 | 68.4 3.6 | 13.24 .17 | 49.2 1.4 |
| Aug. 7.5 | 23.02 +07 | 35.5 3.7 | 23.65 .13 | 43.0 0.5 | 34.14 +10 | 72.1 3.7 | 13.39 .13 | 47.9 1.2 |
| 17.5 | 23.04 -04 | 39.2 3.7 | 23.76 .08 | 42.6 +0.3 | 34.18 -02 | 75.8 3.7 | 13.50 .09 | 46.7 1.0 |
| 27.5 | 22.94 .14 | 42.8 3.6 | 23.82 +04 | 42.5 0.0 | 34.10 .14 | 79.5 3.6 | 13.57 .05 | 45.8 0.8 |
| Sept. 6.4 | 22.74 -25 | 46.3 +3.4 | 23.84 .00 | 42.6 -0.2 | 33.90 -25 | 83.1 +3.5 | 13.60 +01 | 45.0 +0.6 |
| 16.4 | 22.44 .34 | 49.6 3.2 | 23.82 -04 | 42.8 0.3 | 33.59 .36 | 86.6 3.3 | 13.58 -03 | 44.5 0.4 |
| 26.4 | 22.06 .42 | 52.7 2.9 | 23.76 .07 | 43.2 0.4 | 33.18 .46 | 89.7 3.0 | 13.53 .06 | 44.2 +0.2 |
| Oct. 6.4 | 21.59 .50 | 55.4 2.5 | 23.67 .10 | 43.7 0.5 | 32.68 .54 | 92.6 2.7 | 13.46 .09 | 44.1 0.0 |
| 16.3 | 21.06 .56 | 57.6 2.0 | 23.55 .12 | 44.3 0.6 | 32.09 .62 | 95.0 2.2 | 13.35 .11 | 44.2 -0.1 |
| 26.3 | 20.48 -60 | 59.4 +1.5 | 23.43 -13 | 44.9 -0.6 | 31.44 -67 | 97.0 +1.7 | 13.23 -12 | 44.4 -0.3 |
| Nov. 5.3 | 19.86 .62 | 60.8 1.0 | 23.29 .13 | 45.5 0.6 | 30.75 .71 | 98.5 1.2 | 13.11 .13 | 44.8 0.4 |
| 15.3 | 19.23 .64 | 61.5 +0.5 | 23.16 .13 | 46.1 0.6 | 30.02 .73 | 99.5 0.6 | 12.98 .12 | 45.3 0.5 |
| 25.2 | 18.59 .63 | 61.6 -0.1 | 23.04 .12 | 46.7 0.5 | 29.29 .73 | 99.8 +0.1 | 12.86 .11 | 45.9 0.6 |
| Dec. 5.2 | 17.96 .61 | 61.2 0.7 | 22.93 .10 | 47.2 0.5 | 28.56 .70 | 99.6 -0.5 | 12.75 .10 | 46.5 0.7 |
| 15.2 | 17.38 -56 | 60.2 -1.3 | 22.84 -08 | 47.7 -0.4 | 27.87 -67 | 98.8 -1.1 | 12.66 -08 | 47.3 -0.8 |
| 25.1 | 16.84 .50 | 58.6 1.9 | 22.77 .05 | 48.0 0.3 | 27.23 .60 | 97.4 1.7 | 12.58 .06 | 48.0 0.8 |
| 35.1 | 16.38 -43 | 56.4 -2.4 | 22.73 -03 | 48.3 -0.2 | 26.66 -52 | 95.4 -2.2 | 12.53 -04 | 48.8 -0.8 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | α Gruis. | | θ Aquarii. | | π Aquarii. | | η Aquarii. | |
|------------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|
| | Right Ascension. | Declination South. | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination South. |
| | ^h 22 | ^m 1 | ^h 22 | ^m 11 | ^h 22 | ^m 19 | ^h 22 | ^m 29 |
| | | — 47° 29' | | — 8° 19' | | + 0° 49' | | — 0° 40' |
| Jan. 0.1 | 19.37 —.09 | 37.7 +1.2 | 3.12 —.06 | 43.6 —0.5 | 40.90 —.06 | 20.1 —0.9 | 43.62 —.07 | 53.4 —0.8 |
| 10.1 | 19.29 .05 | 36.3 1.5 | 3.07 .03 | 44.1 0.4 | 40.84 .04 | 19.2 0.8 | 43.56 .05 | 54.1 0.7 |
| 20.1 | 19.25 —.01 | 34.6 1.8 | 3.05 —.01 | 44.5 0.3 | 40.81 —.02 | 18.4 0.8 | 43.52 —.03 | 54.9 0.7 |
| 30.1 | 19.26 +.03 | 32.7 2.1 | 3.06 +.02 | 44.7 —0.2 | 40.81 +.01 | 17.7 0.7 | 43.51 .00 | 55.5 0.6 |
| Feb. 9.0 | 19.32 .08 | 30.5 2.3 | 3.09 .05 | 44.8 0.0 | 40.83 .04 | 17.0 0.6 | 43.52 +.03 | 56.0 0.5 |
| 19.0 | 19.42 +.12 | 28.2 +2.4 | 3.16 +.08 | 44.8 +0.1 | 40.88 +.07 | 16.5 —0.4 | 43.56 +.06 | 56.4 —0.3 |
| Mar. 1.0 | 19.56 .17 | 25.7 2.5 | 3.25 .11 | 44.6 0.3 | 40.96 .10 | 16.2 —0.2 | 43.63 .09 | 56.6 —0.1 |
| 11.0 | 19.75 .21 | 23.2 2.6 | 3.38 .14 | 44.1 0.5 | 41.07 .13 | 16.1 0.0 | 43.74 .12 | 56.6 +0.1 |
| 20.9 | 19.98 .26 | 20.6 2.6 | 3.53 .17 | 43.4 0.8 | 41.22 .16 | 16.3 +0.3 | 43.87 .15 | 56.4 0.4 |
| 30.9 | 20.26 .30 | 18.0 2.5 | 3.73 .20 | 42.5 1.0 | 41.40 .19 | 16.7 0.6 | 44.04 .19 | 55.8 0.7 |
| Apr. 9.9 | 20.58 +.34 | 15.6 +2.4 | 3.95 +.23 | 41.4 +1.2 | 41.61 +.22 | 17.5 +0.9 | 44.25 +.22 | 55.0 +0.9 |
| 19.8 | 20.93 .37 | 13.2 2.2 | 4.20 .26 | 40.1 1.4 | 41.85 .25 | 18.5 1.1 | 44.48 .25 | 54.0 1.2 |
| 29.8 | 21.32 .40 | 11.1 2.0 | 4.47 .28 | 38.5 1.6 | 42.12 .28 | 19.7 1.4 | 44.75 .27 | 52.6 1.4 |
| May 9.8 | 21.73 .42 | 9.2 1.8 | 4.77 .30 | 36.9 1.7 | 42.41 .30 | 21.2 1.6 | 45.03 .29 | 51.1 1.6 |
| 19.8 | 22.16 .43 | 7.5 1.5 | 5.08 .31 | 35.1 1.8 | 42.71 .31 | 22.9 1.8 | 45.34 .31 | 49.4 1.8 |
| 29.7 | 22.60 +.44 | 6.1 +1.2 | 5.40 +.32 | 33.2 +1.8 | 43.03 +.32 | 24.8 +1.9 | 45.65 +.32 | 47.5 +1.9 |
| June 8.7 | 23.03 .43 | 5.1 0.8 | 5.72 .32 | 31.4 1.8 | 43.34 .31 | 26.7 2.0 | 45.97 .31 | 45.6 2.0 |
| 18.7 | 23.46 .41 | 4.4 +0.4 | 6.04 .31 | 29.6 1.7 | 43.65 .30 | 28.7 2.0 | 46.28 .30 | 43.6 2.0 |
| 28.6 | 23.86 .39 | 4.1 0.0 | 6.34 .29 | 27.9 1.6 | 43.95 .28 | 30.7 1.9 | 46.58 .29 | 41.6 1.9 |
| July 8.6 | 24.23 .35 | 4.3 —0.3 | 6.61 .26 | 26.3 1.5 | 44.22 .26 | 32.7 1.8 | 46.86 .27 | 39.7 1.8 |
| 18.6 | 24.56 +.30 | 4.8 —0.7 | 6.86 +.23 | 24.9 +1.3 | 44.47 +.23 | 34.5 +1.7 | 47.11 +.24 | 37.9 +1.7 |
| 28.6 | 24.84 .25 | 5.6 1.0 | 7.06 .19 | 23.7 1.1 | 44.68 .19 | 36.2 1.6 | 47.33 .20 | 36.3 1.5 |
| Aug. 7.5 | 25.07 .19 | 6.8 1.3 | 7.23 .15 | 22.7 0.9 | 44.85 .15 | 37.7 1.4 | 47.51 .16 | 34.8 1.3 |
| 17.5 | 25.23 .13 | 8.3 1.6 | 7.36 .10 | 21.9 0.6 | 44.98 .11 | 39.0 1.2 | 47.66 .19 | 33.6 1.1 |
| 27.5 | 25.33 .07 | 10.0 1.8 | 7.44 .06 | 21.4 0.4 | 45.06 .06 | 40.1 1.0 | 47.75 .07 | 32.6 0.9 |
| Sept. 6.5 | 25.36 +.01 | 11.9 —1.9 | 7.48 +.02 | 21.1 +0.2 | 45.11 +.02 | 40.9 +0.7 | 47.81 +.03 | 31.8 +0.7 |
| 16.4 | 25.34 —.05 | 13.8 1.9 | 7.48 —.02 | 21.0 0.0 | 45.11 —.01 | 41.5 0.5 | 47.82 .00 | 31.3 0.4 |
| 26.4 | 25.26 .10 | 15.7 1.9 | 7.44 .05 | 21.1 —0.2 | 45.08 .05 | 41.9 0.3 | 47.80 —.04 | 30.9 +0.2 |
| Oct. 6.4 | 25.13 .15 | 17.6 1.7 | 7.38 .08 | 21.4 0.3 | 45.02 .08 | 42.1 +0.1 | 47.74 .07 | 30.8 0.0 |
| 16.3 | 24.96 .18 | 19.2 1.5 | 7.28 .10 | 21.8 0.4 | 44.93 .10 | 42.2 —0.1 | 47.66 .09 | 30.8 —0.1 |
| 26.3 | 24.76 —.20 | 20.6 —1.3 | 7.17 —.12 | 22.2 —0.5 | 44.82 —.11 | 42.0 —0.2 | 47.56 —.11 | 31.1 —0.3 |
| Nov. 5.3 | 24.55 .22 | 21.8 1.0 | 7.05 .12 | 22.8 0.6 | 44.71 .12 | 41.7 0.4 | 47.45 .12 | 31.4 0.4 |
| 15.3 | 24.33 .21 | 22.5 0.6 | 6.92 .12 | 23.4 0.6 | 44.58 .12 | 41.3 0.5 | 47.33 .12 | 31.9 0.5 |
| 25.2 | 24.12 .20 | 22.9 —0.2 | 6.80 .11 | 24.0 0.6 | 44.46 .12 | 40.7 0.6 | 47.22 .11 | 32.4 0.6 |
| Dec. 5.2 | 23.92 .18 | 22.9 +0.2 | 6.69 .10 | 24.6 0.6 | 44.35 .11 | 40.0 0.7 | 47.10 .10 | 33.1 0.7 |
| 15.2 | 23.75 —.15 | 22.4 +0.6 | 6.59 —.09 | 25.2 —0.6 | 44.25 —.09 | 39.3 —0.8 | 47.00 —.09 | 33.8 —0.7 |
| 25.2 | 23.61 .12 | 21.6 1.0 | 6.52 .07 | 25.8 0.5 | 44.17 .07 | 38.5 0.8 | 46.92 .08 | 34.5 0.7 |
| 35.1 | 23.51 —.08 | 20.4 +1.3 | 6.46 —.05 | 26.3 —0.5 | 44.10 —.05 | 37.7 —0.8 | 46.85 —.06 | 35.3 —0.8 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | 226 Cephei(B.) | | ζ Pegasi. | | ι Cephei. | | λ Aquarii. | |
|------------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination South. |
| | ^h ^m 22 30 | +75° 39' | ^h ^m 22 35 | +10° 15' | ^h ^m 22 45 | +65° 37' | ^h ^m 22 46 | - 8° 9' |
| Jan. 0.2 | 17.84 -54 | 62.6 -1.5 | 59.89 -08 | 39.9 -1.0 | 45.39 -41 | 46.6 -1.4 | 54.09 -08 | 44.7 -0.5 |
| 10.1 | 17.14 .65 | 60.8 2.0 | 59.82 .06 | 38.8 1.1 | 45.00 .36 | 44.9 1.9 | 54.02 .06 | 45.2 0.4 |
| 20.1 | 16.54 .54 | 58.6 2.4 | 59.76 .04 | 37.6 1.2 | 44.67 .30 | 42.8 2.4 | 53.98 .04 | 45.6 0.3 |
| 30.1 | 16.05 .41 | 55.9 2.8 | 59.74 -02 | 36.5 1.1 | 44.39 .24 | 40.2 2.7 | 53.95 -01 | 45.8 -0.2 |
| Feb. 9.0 | 15.70 .27 | 52.9 3.1 | 59.73 +01 | 35.3 1.0 | 44.19 .16 | 37.3 2.9 | 53.95 +01 | 45.9 0.0 |
| 19.0 | 15.51 -11 | 49.7 -3.2 | 59.76 +04 | 34.3 -0.9 | 44.08 -07 | 34.3 -3.0 | 53.97 +04 | 45.9 +0.2 |
| Mar. 1.0 | 15.48 +05 | 46.5 3.5 | 59.82 .08 | 33.5 0.7 | 44.06 +03 | 31.2 3.0 | 54.03 .07 | 45.5 0.4 |
| 11.0 | 15.62 .21 | 43.4 3.0 | 59.92 .11 | 32.8 0.5 | 44.14 .12 | 28.2 2.9 | 54.12 .10 | 45.0 0.6 |
| 20.9 | 15.92 .37 | 40.4 2.7 | 60.05 .15 | 32.5 -0.2 | 44.31 .22 | 25.4 2.7 | 54.24 .14 | 44.2 0.8 |
| 30.9 | 16.37 .52 | 37.8 2.4 | 60.21 .18 | 32.4 +0.1 | 44.57 .31 | 22.9 2.3 | 54.40 .17 | 43.3 1.1 |
| Apr. 9.9 | 16.96 +64 | 35.6 -2.0 | 60.41 +22 | 32.7 +0.4 | 44.93 +39 | 20.8 -1.9 | 54.59 +21 | 42.1 +1.3 |
| 19.9 | 17.66 .75 | 33.9 1.5 | 60.64 .25 | 33.3 0.7 | 45.35 .46 | 19.2 1.4 | 54.82 .24 | 40.7 1.5 |
| 29.8 | 18.45 .82 | 32.7 0.9 | 60.90 .27 | 34.2 1.1 | 45.84 .51 | 18.1 0.8 | 55.07 .27 | 39.1 1.7 |
| May 9.8 | 19.31 .88 | 32.2 -0.3 | 61.19 .29 | 35.5 1.4 | 46.39 .55 | 17.6 -0.2 | 55.36 .29 | 37.3 1.8 |
| 19.8 | 20.21 .90 | 32.2 +0.3 | 61.49 .31 | 37.0 1.6 | 46.96 .58 | 17.7 +0.4 | 55.66 .31 | 35.5 1.9 |
| 29.7 | 21.12 +89 | 32.8 +0.9 | 61.81 +32 | 38.8 +1.9 | 47.55 +59 | 16.4 +0.9 | 55.97 +32 | 33.5 +2.0 |
| June 8.7 | 22.01 .86 | 34.1 1.5 | 62.13 .31 | 40.8 2.1 | 48.13 .58 | 19.6 1.5 | 56.29 .29 | 31.6 2.0 |
| 18.7 | 22.85 .81 | 35.8 2.0 | 62.44 .30 | 42.9 2.2 | 48.70 .55 | 21.4 2.0 | 56.62 .31 | 29.6 1.9 |
| 28.7 | 23.62 .73 | 38.1 2.5 | 62.74 .29 | 45.1 2.2 | 49.23 .51 | 23.6 2.5 | 56.92 .30 | 27.8 1.8 |
| July 8.6 | 24.31 .63 | 40.8 2.9 | 63.02 .27 | 47.3 2.2 | 49.72 .45 | 26.3 2.8 | 57.22 .28 | 26.1 1.6 |
| 18.6 | 24.89 +52 | 43.8 +3.2 | 63.28 +24 | 49.5 +2.1 | 50.14 +39 | 29.3 +3.1 | 57.49 +25 | 24.5 +1.4 |
| 28.6 | 25.36 .40 | 47.2 3.4 | 63.50 .20 | 51.6 2.0 | 50.50 .32 | 32.6 3.3 | 57.72 .22 | 23.2 1.2 |
| Aug. 7.6 | 25.69 .27 | 50.8 3.6 | 63.68 .16 | 53.6 1.9 | 50.78 .23 | 36.1 3.6 | 57.92 .18 | 22.1 1.0 |
| 17.5 | 25.89 +13 | 54.5 3.7 | 63.82 .12 | 55.4 1.7 | 50.97 .15 | 39.8 3.7 | 58.08 .14 | 21.2 0.7 |
| 27.5 | 25.95 -01 | 58.2 3.8 | 63.92 .08 | 57.1 1.5 | 51.08 +06 | 43.4 3.7 | 58.20 .09 | 20.6 0.5 |
| Sept. 6.5 | 25.87 -14 | 62.0 +3.7 | 63.97 +04 | 58.5 +1.3 | 51.10 -02 | 47.1 +3.6 | 58.27 +05 | 20.3 +0.2 |
| 16.4 | 25.66 .27 | 65.7 3.6 | 63.99 .00 | 59.7 1.1 | 51.04 .10 | 50.7 3.5 | 58.31 +01 | 20.2 0.0 |
| 26.4 | 25.32 .40 | 69.2 3.4 | 63.97 -04 | 60.7 0.8 | 50.91 .17 | 54.1 3.3 | 58.30 -02 | 20.2 -0.2 |
| Oct. 6.4 | 24.86 .51 | 72.4 3.1 | 63.92 .07 | 61.4 0.6 | 50.70 .24 | 57.2 3.0 | 58.26 .05 | 20.5 0.3 |
| 16.4 | 24.30 .61 | 75.3 2.7 | 63.84 .09 | 61.9 0.4 | 50.42 .31 | 60.1 2.7 | 58.20 .08 | 20.9 0.5 |
| 26.3 | 23.65 -09 | 77.9 +2.3 | 63.74 -11 | 62.1 +0.1 | 50.09 -36 | 62.5 +2.3 | 58.11 -10 | 21.4 -0.6 |
| Nov. 5.3 | 22.91 .78 | 80.0 1.8 | 63.63 .12 | 62.2 -0.1 | 49.71 .40 | 64.5 1.8 | 58.00 .11 | 22.0 0.6 |
| 15.3 | 22.12 .81 | 81.5 1.3 | 63.50 .12 | 62.0 0.3 | 49.29 .43 | 66.0 1.2 | 57.89 .11 | 22.7 0.7 |
| 25.3 | 21.29 .84 | 82.5 0.7 | 63.38 .12 | 61.6 0.5 | 48.85 .45 | 67.0 0.7 | 57.78 .11 | 23.3 0.7 |
| Dec. 5.2 | 20.44 .84 | 82.9 +0.1 | 63.27 .11 | 61.0 0.7 | 48.40 .45 | 67.4 +0.1 | 57.66 .11 | 24.0 0.6 |
| 15.2 | 19.60 -82 | 82.7 -0.5 | 63.16 -10 | 60.2 -0.8 | 47.95 -44 | 67.2 -0.5 | 57.56 -10 | 24.6 -0.6 |
| 25.2 | 18.80 .78 | 81.9 1.1 | 63.06 .09 | 59.3 1.0 | 47.51 .42 | 66.4 1.0 | 57.47 .08 | 25.2 0.5 |
| 35.1 | 18.05 -70 | 80.5 -1.7 | 62.98 -07 | 58.3 -1.1 | 47.10 -39 | 65.1 -1.6 | 57.39 -07 | 25.7 -0.4 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON

| Mean Solar Date. | α Piscis Australis. (Fomalhaut.) | | α Pegasi. (Markab.) | | ϵ Cephei. | | θ Piscium. | |
|------------------------|--|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|
| | Right Ascension. | Declination South. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h ^m 22 51 | —30° 11' | ^h ^m 22 59 | +14° 36' | ^h ^m 23 14 | +67° 30' | ^h ^m 23 22 | +5° 46' |
| Jan. 0.2 | ^s 35.94 —.10 | 76.4 +0.9 | ^s 18.31 —.10 | 61.3 —1.1 | ^s 6.72 —.47 | 65.3 —1.0 | ^s 24.90 —.10 | 42.5 —0.8 |
| 10.2 | 35.85 .07 | 76.1 0.5 | 18.32 .08 | 61.2 1.2 | 6.27 .43 | 64.0 1.6 | 24.81 .09 | 41.6 0.9 |
| 20.1 | 35.79 .05 | 75.4 0.8 | 18.15 .06 | 62.0 1.9 | 5.86 .38 | 62.2 2.0 | 24.73 .07 | 40.8 0.8 |
| 30.1 | 35.76 —.02 | 74.5 1.1 | 18.10 .04 | 60.7 1.3 | 5.51 .31 | 59.9 2.4 | 24.67 .05 | 40.0 0.8 |
| Feb. 9.1 | 35.75 +.01 | 73.3 1.3 | 18.08 —.01 | 59.4 1.2 | 5.23 .23 | 57.2 2.7 | 24.63 —.03 | 39.2 0.7 |
| 19.0 | 35.77 +.04 | 71.9 +1.5 | 18.08 +.02 | 58.2 —1.1 | 5.04 —.14 | 54.4 —2.9 | 24.62 .00 | 38.5 —0.6 |
| Mar. 1.0 | 35.83 .08 | 70.3 1.7 | 18.11 .05 | 57.2 0.9 | 4.94 —.04 | 51.4 3.0 | 24.63 +.03 | 38.0 0.4 |
| 11.0 | 35.93 .11 | 68.5 1.9 | 18.18 .09 | 56.3 0.7 | 4.95 +.06 | 48.3 3.0 | 24.68 .06 | 37.7 —0.3 |
| 21.0 | 36.06 .15 | 66.5 2.1 | 18.29 .19 | 55.7 0.5 | 5.06 .17 | 45.4 2.8 | 24.76 .10 | 37.6 0.0 |
| 30.9 | 36.23 .19 | 64.4 2.2 | 18.43 .16 | 55.4 —0.2 | 5.28 .27 | 42.8 2.5 | 24.88 .14 | 37.8 +0.3 |
| Apr. 9.9 | 36.44 +.23 | 62.1 +2.3 | 18.61 +.20 | 55.4 +0.2 | 5.60 +.26 | 40.4 —2.1 | 25.04 +.18 | 38.3 +0.6 |
| 19.9 | 36.69 .26 | 59.8 2.3 | 18.83 .23 | 55.7 0.5 | 6.01 .44 | 38.5 1.7 | 25.24 .21 | 39.0 0.9 |
| 29.9 | 36.97 .29 | 57.6 2.3 | 19.08 .26 | 56.4 0.9 | 6.50 .52 | 37.1 1.1 | 25.47 .24 | 40.1 1.2 |
| May 9.8 | 37.28 .32 | 55.3 2.2 | 19.35 .29 | 57.5 1.2 | 7.05 .57 | 36.3 —0.6 | 25.73 .27 | 41.4 1.5 |
| 19.8 | 37.61 .34 | 53.2 2.1 | 19.65 .31 | 58.9 1.5 | 7.64 .61 | 36.0 0.0 | 26.01 .29 | 43.0 1.7 |
| 29.8 | 37.96 +.35 | 51.2 +1.9 | 19.97 +.32 | 60.5 +1.8 | 8.27 +.63 | 36.3 +0.6 | 26.32 +.31 | 44.8 +1.9 |
| June 8.7 | 38.32 .36 | 49.3 1.7 | 20.29 .32 | 62.4 2.0 | 8.90 .63 | 37.2 1.1 | 26.63 .32 | 46.7 2.0 |
| 18.7 | 38.68 .35 | 47.8 1.5 | 20.61 .32 | 64.5 2.2 | 9.53 .61 | 38.6 1.7 | 26.95 .32 | 48.6 2.1 |
| 28.7 | 39.03 .34 | 46.4 1.2 | 20.92 .30 | 66.8 2.3 | 10.13 .58 | 40.5 2.2 | 27.27 .31 | 50.9 2.1 |
| July 8.7 | 39.36 .32 | 45.5 0.8 | 21.22 .28 | 69.1 2.3 | 10.69 .53 | 42.9 2.6 | 27.57 .29 | 53.0 2.1 |
| 18.6 | 39.67 +.29 | 44.8 +0.5 | 21.49 +.25 | 71.4 +2.3 | 11.19 +.47 | 45.6 +2.9 | 27.85 +.27 | 55.1 +2.0 |
| 28.6 | 39.94 .25 | 44.5 +0.1 | 21.72 .22 | 73.7 2.2 | 11.63 .40 | 48.7 3.2 | 28.10 .24 | 57.0 1.9 |
| Aug. 7.6 | 40.17 .21 | 44.5 —0.2 | 21.93 .18 | 75.9 2.1 | 11.99 .32 | 52.1 3.5 | 28.32 .20 | 58.9 1.7 |
| 17.6 | 40.36 .16 | 44.9 0.5 | 22.09 .14 | 77.9 2.0 | 12.27 .23 | 55.7 3.6 | 28.51 .16 | 60.5 1.5 |
| 27.5 | 40.50 .11 | 45.6 0.8 | 22.21 .10 | 79.8 1.8 | 12.46 .15 | 59.4 3.7 | 28.65 .12 | 62.0 1.3 |
| Sept. 6.5 | 40.59 +.07 | 46.5 —1.0 | 22.29 +.06 | 81.5 +1.6 | 12.56 +.06 | 63.1 +3.7 | 28.76 +.08 | 63.2 +1.1 |
| 16.5 | 40.63 +.02 | 47.6 1.2 | 22.33 +.02 | 83.0 1.4 | 12.57 —.03 | 66.7 3.6 | 28.82 .04 | 64.2 0.9 |
| 26.5 | 40.63 —.02 | 48.9 1.3 | 22.33 —.01 | 84.3 1.1 | 12.50 .11 | 70.3 3.5 | 28.85 +.01 | 64.9 0.6 |
| Oct. 6.4 | 40.58 .06 | 50.3 1.4 | 22.30 .05 | 85.3 0.9 | 12.35 .19 | 73.7 3.2 | 28.84 —.02 | 65.5 0.4 |
| 16.4 | 40.50 .09 | 51.7 1.4 | 22.23 .07 | 86.0 0.6 | 12.12 .26 | 76.8 2.9 | 28.81 .05 | 65.8 +0.2 |
| 26.4 | 40.40 —.12 | 53.1 —1.3 | 22.15 —.09 | 86.5 +0.4 | 11.82 —.33 | 79.6 +2.6 | 28.74 —.07 | 65.9 0.0 |
| Nov. 5.3 | 40.27 .13 | 54.3 1.2 | 22.05 .11 | 86.8 +0.1 | 11.46 .38 | 81.9 2.2 | 28.66 .09 | 65.8 —0.2 |
| 15.3 | 40.13 .14 | 55.4 1.0 | 21.93 .12 | 86.8 —0.1 | 11.05 .43 | 83.8 1.7 | 28.57 .10 | 65.6 0.3 |
| 25.3 | 39.99 .14 | 56.3 0.8 | 21.82 .12 | 86.6 0.3 | 10.61 .46 | 85.2 1.1 | 28.46 .11 | 65.2 0.5 |
| Dec. 5.3 | 39.85 .13 | 56.9 0.5 | 21.70 .12 | 86.1 0.6 | 10.13 .48 | 86.1 +0.5 | 28.36 .11 | 64.6 0.6 |
| 15.2 | 39.72 —.12 | 57.3 —0.2 | 21.58 —.11 | 85.4 —0.8 | 9.65 —.49 | 86.3 0.0 | 28.25 —.11 | 64.0 —0.7 |
| 25.2 | 39.60 .10 | 57.3 +0.1 | 21.47 .10 | 84.6 0.9 | 9.16 .48 | 86.0 —0.6 | 28.15 .10 | 63.3 0.8 |
| 35.2 | 39.51 —.09 | 57.1 +0.3 | 21.38 —.09 | 83.5 —1.1 | 8.69 —.46 | 85.0 —1.2 | 28.05 —.09 | 62.5 —0.9 |

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | ϵ Piscium. | | γ Cephei. | | Groombridge 4163. | | ω Piscium. | |
|------------------------|---------------------------------------|---------------------------------------|---------------------------------------|-----------------------|---------------------------------------|------------------------|---------------------------------------|--|
| | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. | Right Ascension. | Declination North. |
| | ^h 23 ^m 34 | + [°] 5 ['] 1 | ^h 23 ^m 34 | +77 [°] 1 | ^h 23 ^m 49 | +73 [°] 47 | ^h 23 ^m 53 | + [°] 6 ['] 15 |
| Jan. 0.2 | 19.28 -10 | 61.6 -0.8 | 49.33 -90 | 38.3 -0.6 | 29.64 -70 | 85.7 -0.4 | 41.60 -11 | 29.7 -0.7 |
| 10.2 | 19.19 .09 | 60.8 0.8 | 48.46 .85 | 37.4 1.2 | 28.95 .67 | 85.0 1.0 | 41.50 .10 | 28.9 0.8 |
| 20.2 | 19.11 .07 | 60.0 0.8 | 47.64 .77 | 36.0 1.7 | 28.30 .69 | 83.7 1.6 | 41.40 .09 | 28.2 0.8 |
| 30.1 | 19.04 .06 | 59.2 0.8 | 46.91 .66 | 34.0 2.2 | 27.71 .54 | 81.8 2.1 | 41.32 .07 | 27.4 0.7 |
| Feb. 9.1 | 18.99 .04 | 58.5 0.7 | 46.31 .53 | 31.6 2.6 | 27.21 .45 | 79.5 2.5 | 41.26 .05 | 26.6 0.7 |
| 19.1 | 18.97 -01 | 57.9 -0.5 | 45.85 -38 | 28.8 -2.9 | 26.81 -33 | 76.9 -2.8 | 41.22 -03 | 26.0 -0.6 |
| Mar. 1.1 | 18.97 +02 | 57.4 0.4 | 45.55 .21 | 25.8 3.0 | 26.54 .20 | 74.0 3.0 | 41.20 .00 | 25.5 0.4 |
| 11.0 | 19.01 .05 | 57.2 -0.2 | 45.43 -03 | 22.7 3.1 | 26.41 -06 | 70.9 3.0 | 41.22 +03 | 25.2 -0.2 |
| 21.0 | 19.08 .09 | 57.1 +0.1 | 45.49 +15 | 19.6 3.0 | 26.43 +09 | 67.9 2.9 | 41.27 .07 | 25.1 0.0 |
| 30.9 | 19.19 .13 | 57.3 0.4 | 45.73 .33 | 16.7 2.8 | 26.59 .23 | 65.0 2.8 | 41.36 .11 | 25.3 +0.3 |
| Apr. 9.9 | 19.34 +17 | 57.8 +0.6 | 46.15 +50 | 14.0 -2.5 | 26.90 +37 | 62.4 -2.5 | 41.49 +15 | 25.7 +0.6 |
| 19.9 | 19.52 .20 | 58.6 0.9 | 46.73 .65 | 11.8 2.1 | 27.34 .49 | 60.0 2.1 | 41.66 .19 | 26.4 0.9 |
| 29.9 | 19.75 .24 | 59.7 1.2 | 47.45 .77 | 9.9 1.6 | 27.90 .61 | 58.1 1.7 | 41.86 .22 | 27.4 1.1 |
| May 9.9 | 20.00 .27 | 61.0 1.4 | 48.28 .88 | 8.6 1.0 | 28.56 .70 | 56.7 1.1 | 42.11 .25 | 28.7 1.4 |
| 19.8 | 20.28 .29 | 62.6 1.7 | 49.21 .95 | 7.8 -0.5 | 29.30 .77 | 55.9 -0.6 | 42.38 .28 | 30.2 1.6 |
| 29.8 | 20.58 +31 | 64.4 +1.9 | 50.18 +99 | 7.6 +0.1 | 30.10 +81 | 55.6 0.0 | 42.67 +30 | 31.9 +1.8 |
| June 8.8 | 20.90 .32 | 66.3 2.0 | 51.19 1.01 | 8.0 0.6 | 30.94 .84 | 55.8 +0.6 | 42.98 .32 | 33.8 2.0 |
| 18.7 | 21.22 .32 | 68.3 2.1 | 52.20 .99 | 8.9 1.2 | 31.78 .83 | 56.7 1.1 | 43.30 .32 | 35.8 2.1 |
| 28.7 | 21.53 .31 | 70.4 2.1 | 53.17 .95 | 10.4 1.7 | 32.60 .81 | 58.1 1.6 | 43.62 .32 | 37.9 2.1 |
| July 8.7 | 21.84 .30 | 72.5 2.0 | 54.09 .88 | 12.5 2.2 | 33.39 .76 | 60.0 2.1 | 43.93 .31 | 40.0 2.1 |
| 18.7 | 22.13 +27 | 74.6 +2.0 | 54.93 +79 | 14.9 +2.6 | 34.12 +69 | 62.3 +2.5 | 44.23 +29 | 42.1 +2.0 |
| 28.6 | 22.39 .24 | 76.5 1.9 | 55.67 .68 | 17.8 3.0 | 34.77 .61 | 65.1 2.9 | 44.50 .28 | 44.1 1.9 |
| Aug. 7.6 | 22.62 .21 | 78.3 1.7 | 56.29 .56 | 21.0 3.3 | 35.34 .52 | 68.2 3.2 | 44.75 .23 | 46.0 1.8 |
| 17.6 | 22.82 .17 | 79.9 1.5 | 56.79 .43 | 24.4 3.5 | 35.81 .42 | 71.6 3.5 | 44.96 .19 | 47.6 1.6 |
| 27.6 | 22.97 .14 | 81.3 1.3 | 57.16 .29 | 28.1 3.7 | 36.17 .31 | 75.1 3.7 | 45.13 .15 | 49.1 1.4 |
| Sept. 6.5 | 23.09 +10 | 82.5 +1.0 | 57.38 +15 | 31.9 +3.8 | 36.42 +19 | 78.8 +3.8 | 45.27 +12 | 50.4 +1.9 |
| 16.5 | 23.17 .06 | 83.4 0.8 | 57.45 .00 | 35.7 3.8 | 36.56 +08 | 82.6 3.8 | 45.36 .08 | 51.5 0.9 |
| 26.5 | 23.21 +02 | 84.1 0.6 | 57.38 -14 | 39.5 3.7 | 36.57 -04 | 86.4 3.7 | 45.42 .04 | 52.3 0.7 |
| Oct. 6.4 | 23.22 -01 | 84.6 0.4 | 57.18 .29 | 43.2 3.6 | 36.48 .15 | 90.0 3.6 | 45.45 +01 | 52.8 0.5 |
| 16.4 | 23.19 .04 | 84.9 +0.2 | 56.83 .41 | 46.6 3.4 | 36.27 .26 | 93.5 3.4 | 45.44 -02 | 53.2 0.3 |
| 26.4 | 23.14 -06 | 85.0 0.0 | 56.36 -53 | 49.8 +3.0 | 35.96 -36 | 96.7 +3.1 | 45.41 -04 | 53.4 +0.1 |
| Nov. 5.4 | 23.07 .08 | 84.9 -0.2 | 55.77 .64 | 52.7 2.6 | 35.54 .45 | 99.6 2.7 | 45.35 .06 | 53.3 -0.1 |
| 15.3 | 22.98 .09 | 84.6 0.3 | 55.08 .73 | 55.1 2.2 | 35.05 .53 | 102.1 2.2 | 45.28 .08 | 53.1 0.3 |
| 25.3 | 22.89 .10 | 84.2 0.5 | 54.30 .81 | 57.0 1.7 | 34.48 .60 | 104.1 1.7 | 45.19 .09 | 52.8 0.4 |
| Dec. 5.3 | 22.78 .10 | 83.7 0.6 | 53.45 .87 | 58.4 1.1 | 33.84 .65 | 105.6 1.2 | 45.09 .10 | 52.3 0.5 |
| 15.3 | 22.68 -10 | 83.0 -0.7 | 52.56 -90 | 59.2 +0.5 | 33.17 -64 | 106.5 +0.6 | 44.99 -10 | 51.7 -0.6 |
| 25.2 | 22.58 .10 | 82.3 0.7 | 51.66 .90 | 59.4 -0.1 | 32.47 .70 | 106.8 0.0 | 44.89 .10 | 51.1 0.7 |
| 35.2 | 22.48 -09 | 81.6 -0.8 | 50.76 -87 | 58.9 -0.8 | 31.78 -69 | 106.5 -0.6 | 44.78 -10 | 50.4 -0.8 |

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | β Cassiop. | γ Androm. | σ Androm. | ϵ Ceti. | 6 Urs. Min. S. P. | 44 Piscium. | π Androm. | ϕ Cassiop |
|------------------------|---|---|---|---|---|---|---|---|
| | $31^{\circ} 27'$ | $44^{\circ} 32'$ | $53^{\circ} 49'$ | $99^{\circ} 26'$ | $358^{\circ} 18'$ | $88^{\circ} 40'$ | $56^{\circ} 53'$ | $42^{\circ} 19'$ |
| | $\begin{smallmatrix} h & m \\ 0 & 3 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 0 & 4 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 0 & 12 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 0 & 13 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 0 & 13 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 0 & 19 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 0 & 31 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 0 & 38 \end{smallmatrix}$ |
| (Dec. 30.3) | $20.19 - .33$ | $37.99 - .32$ | $36.76 - .16$ | $51.19 - .09$ | $89.36 + 7.76$ | $47.80 - .12$ | $2.41 - .18$ | $37.89 - .33$ |
| Jan. 9.2 | $19.87 .31$ | $37.78 .30$ | $36.60 .16$ | $51.10 .10$ | $97.12 7.65$ | $47.68 .11$ | $2.23 .17$ | $37.66 .33$ |
| 19.2 | $19.56 .39$ | $37.59 .19$ | $36.45 .15$ | $51.00 .10$ | $104.66 7.38$ | $47.60 .10$ | $2.08 .16$ | $37.43 .33$ |
| 29.2 | $19.29 - .36$ | $37.40 - .18$ | $36.30 - .14$ | $50.91 - .09$ | $111.68 + 6.64$ | $47.51 - .09$ | $1.93 - .15$ | $37.21 - .31$ |
| . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . |
| Aug. 26.6 | $24.58 + .35$ | $41.80 + .19$ | $40.31 + .30$ | $54.58 + .18$ | $54.89 - 3.00$ | $51.10 + .16$ | $5.74 + .21$ | $41.43 + .25$ |
| Sept. 5.5 | $24.79 .17$ | $41.97 .15$ | $40.49 .15$ | $54.74 .14$ | $52.30 2.13$ | $51.25 .14$ | $5.93 .17$ | $41.66 .30$ |
| 15.5 | $24.92 .10$ | $42.09 .10$ | $40.62 .10$ | $54.86 .10$ | $50.71 - 1.07$ | $51.38 .12$ | $6.08 .13$ | $41.84 .15$ |
| 25.5 | $25.00 + .05$ | $42.17 + .05$ | $40.70 .06$ | $54.94 .07$ | $50.17 .00$ | $51.47 .08$ | $6.18 .09$ | $41.97 .10$ |
| Oct. 5.5 | $25.02 - .01$ | $42.20 .00$ | $40.74 + .02$ | $55.00 + .04$ | $50.73 + 1.11$ | $51.52 .04$ | $6.26 .05$ | $42.05 .06$ |
| 15.4 | $24.97 - .07$ | $42.18 - .04$ | $40.75 - .02$ | $55.01 .00$ | $52.39 + 2.90$ | $51.55 + .01$ | $6.20 + .01$ | $42.09 + .02$ |
| 25.4 | $24.88 .19$ | $42.13 .07$ | $40.72 .05$ | $54.99 - .03$ | $55.13 3.28$ | $51.54 - .02$ | $6.28 - .02$ | $42.08 - .03$ |
| Nov. 4.4 | $24.73 .17$ | $42.04 .11$ | $40.66 .08$ | $54.96 .05$ | $58.96 4.34$ | $51.51 .04$ | $6.25 .05$ | $42.03 .07$ |
| 14.4 | $24.54 .22$ | $41.91 .14$ | $40.57 .10$ | $54.89 .07$ | $63.80 5.30$ | $51.45 .06$ | $6.19 .08$ | $41.94 .10$ |
| 24.3 | $24.29 .25$ | $41.76 .16$ | $40.46 .12$ | $54.81 .08$ | $69.56 6.14$ | $51.38 .08$ | $6.10 .10$ | $41.82 .13$ |
| Dec. 4.3 | $24.04 - .27$ | $41.59 - .18$ | $40.33 - .14$ | $54.72 - .09$ | $76.08 + 6.84$ | $51.29 - .09$ | $5.99 - .11$ | $41.67 - .16$ |
| 14.3 | $23.74 .30$ | $41.40 .19$ | $40.18 .15$ | $54.62 .10$ | $83.23 7.36$ | $51.20 .09$ | $5.87 .13$ | $41.50 .18$ |
| 24.2 | $23.43 .31$ | $41.21 .30$ | $40.02 .16$ | $54.51 .10$ | $90.81 7.66$ | $51.11 .10$ | $5.73 .15$ | $41.30 .30$ |
| 34.2 | $23.12 - .32$ | $41.00 - .21$ | $39.87 - .16$ | $54.41 - .10$ | $98.55 + 7.71$ | $51.00 - .10$ | $5.57 - .17$ | $41.09 - .22$ |
| Mean Solar Date. | δ Piscium. | γ Cassiop. | μ Androm. | 43 Cephei. | κ Tucanæ. | f Piscium. | κ Octantis, S. P. | ν Androm. |
| | $83^{\circ} 0'$ | $29^{\circ} 52'$ | $52^{\circ} 6'$ | $4^{\circ} 20'$ | $159^{\circ} 27'$ | $86^{\circ} 58'$ | $184^{\circ} 46'$ | $49^{\circ} 8'$ |
| | $\begin{smallmatrix} h & m \\ 0 & 43 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 0 & 50 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 0 & 50 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 0 & 53 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 1 & 12 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 1 & 12 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 1 & 23 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 1 & 30 \end{smallmatrix}$ |
| (Dec. 30.3) | $0.64 - .11$ | $6.64 - .34$ | $41.12 - .16$ | $52.77 - 2.85$ | $4.86 - .54$ | $9.78 - .11$ | $16.50 + 2.83$ | $23.22 - .16$ |
| Jan. 9.2 | $0.53 .12$ | $6.30 .34$ | $40.95 .17$ | $49.92 2.84$ | $4.32 .53$ | $9.66 .11$ | $19.33 2.83$ | $23.05 .18$ |
| 19.2 | $0.41 .11$ | $5.96 .33$ | $40.78 .17$ | $47.08 2.81$ | $3.80 .51$ | $9.55 .11$ | $22.16 2.78$ | $22.86 .21$ |
| 29.2 | $0.31 - .10$ | $5.63 - .32$ | $40.60 - .17$ | $44.30 - 2.74$ | $3.30 - .49$ | $9.43 - .11$ | $24.87 + 2.64$ | $22.64 - .23$ |
| . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . | . . . |
| Sept. 5.6 | $3.91 + .15$ | $10.87 + .36$ | $44.60 + .20$ | $68.10 + 1.50$ | $9.13 + .40$ | $12.78 + .21$ | $12.23 - 1.60$ | $26.40 + .26$ |
| 15.5 | $4.05 .13$ | $11.11 .21$ | $44.78 .15$ | $69.40 1.10$ | $9.49 .32$ | $12.97 .16$ | $10.84 1.17$ | $26.64 .21$ |
| 25.5 | $4.17 .10$ | $11.30 .15$ | $44.91 .11$ | $70.28 .68$ | $9.77 .22$ | $13.10 .12$ | $9.89 .72$ | $26.83 .17$ |
| Oct. 5.5 | $4.24 .07$ | $11.40 .08$ | $45.01 .08$ | $70.75 + .36$ | $9.92 + .11$ | $13.21 .09$ | $9.40 - .25$ | $26.99 .13$ |
| 15.5 | $4.30 + .04$ | $11.46 + .03$ | $45.07 + .04$ | $70.80 - .17$ | $9.98 .00$ | $13.29 .06$ | $9.39 + .25$ | $27.10 .09$ |
| 25.4 | $4.31 .00$ | $11.46 - .03$ | $45.09 .00$ | $70.41 - .61$ | $9.93 - .11$ | $13.33 + .03$ | $9.90 + .74$ | $27.17 + .06$ |
| Nov. 4.4 | $4.29 - .03$ | $11.39 .09$ | $45.07 - .03$ | $69.58 1.04$ | $9.76 .21$ | $13.34 .00$ | $10.88 1.90$ | $27.21 + .02$ |
| 14.4 | $4.27 .05$ | $11.27 .15$ | $45.02 .06$ | $68.33 1.45$ | $9.51 .30$ | $13.33 - .02$ | $12.38 1.70$ | $27.21 - .02$ |
| 24.4 | $4.21 .07$ | $11.09 .20$ | $44.94 .09$ | $66.69 1.83$ | $9.16 .38$ | $13.29 .04$ | $14.27 2.08$ | $27.17 .06$ |
| Dec. 4.3 | $4.14 .08$ | $10.87 .24$ | $44.84 .12$ | $64.66 2.20$ | $8.74 .44$ | $13.24 .06$ | $16.54 2.41$ | $27.09 .09$ |
| 14.3 | $4.05 - .09$ | $10.61 - .28$ | $44.71 - .14$ | $62.32 - 2.48$ | $8.28 - .48$ | $13.17 - .08$ | $19.09 + 2.64$ | $26.99 - .12$ |
| 24.3 | $3.95 .10$ | $10.30 .32$ | $44.56 .15$ | $59.72 2.68$ | $7.77 .51$ | $13.08 .09$ | $21.82 2.78$ | $26.86 .15$ |
| 34.2 | $3.84 - .11$ | $9.98 - .34$ | $44.40 - .17$ | $56.97 - 2.80$ | $7.25 - .54$ | $12.99 - .10$ | $24.66 + 2.83$ | $26.70 - .17$ |

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | π Piscium. | ν Piscium. | ζ Ceti. | γ Androm. | β Trianguli. | 4 Urs. Min., S. P. | γ Trianguli. | 67 Ceti. |
|------------------------|---------------------------------|--------------------------------|----------------------------------|---------------------------------|---------------------------------|--------------------------------|---------------------------------|---------------------------------|
| | $78^{\circ} 25'$ h m 1 31 | $85^{\circ} 4'$ h m 1 35 | $100^{\circ} 52'$ h m 1 46 | $48^{\circ} 12'$ h m 1 57 | $55^{\circ} 32'$ h m 2 3 | $348^{\circ} 4'$ h m 2 9 | $56^{\circ} 39'$ h m 2 10 | $96^{\circ} 55'$ h m 2 11 |
| (Dec.30.3) | 18.51 - .11 | 44.90 - .09 | 4.32 - .12 | 11.87 - .16 | 2.88 - .14 | 14.73 +1.03 | 49.51 - .12 | 32.37 - .09 |
| Jan. 9.3 | 18.39 .12 | 44.80 .11 | 4.20 .12 | 11.70 .18 | 2.74 .15 | 15.80 1.10 | 49.38 .14 | 32.27 .11 |
| 19.2 | 18.27 .12 | 44.68 .12 | 4.08 .13 | 11.52 .19 | 2.58 .16 | 16.93 1.15 | 49.22 .16 | 32.16 .12 |
| 29.2 | 18.15 .12 | 44.55 .12 | 3.95 .13 | 11.32 .20 | 2.41 .17 | 18.09 1.15 | 49.05 .17 | 32.02 .13 |
| Feb. 8.2 | 18.03 .12 | 44.44 .11 | 3.82 .13 | 11.11 .19 | 2.23 .17 | 19.22 1.11 | 48.88 .18 | 31.89 .14 |
| 18.2 | 17.90 - .12 | 44.33 - .10 | 3.69 - .12 | 10.93 - .18 | 2.07 - .16 | 20.31 +1.04 | 48.71 - .17 | 31.75 - .13 |
| Sept.25.6 | 21.74 + .14 | 48.08 + .14 | 7.32 + .16 | 15.34 + .20 | 6.18 + .19 | 12.69 - .55 | 52.72 + .20 | 35.20 + .16 |
| Oct. 5.5 | 21.87 .11 | 48.21 .11 | 7.47 .13 | 15.53 .17 | 6.36 .17 | 12.21 .40 | 52.91 .18 | 35.37 .15 |
| 15.5 | 21.97 .08 | 48.31 .08 | 7.57 .09 | 15.69 .14 | 6.52 .14 | 11.88 .25 | 53.08 .15 | 35.49 .12 |
| 25.5 | 22.03 + .05 | 48.38 + .06 | 7.66 + .06 | 15.80 + .09 | 6.63 + .10 | 11.72 - .08 | 53.20 + .11 | 35.60 + .09 |
| Nov. 4.5 | 22.06 + .02 | 48.42 + .03 | 7.70 + .03 | 15.87 .05 | 6.71 .06 | 11.73 + .10 | 53.29 .07 | 35.68 .06 |
| 14.4 | 22.08 .00 | 48.44 .00 | 7.72 .00 | 15.90 + .02 | 6.76 + .02 | 11.92 .29 | 53.35 + .04 | 35.71 + .03 |
| 24.4 | 22.05 - .03 | 48.42 - .03 | 7.71 - .02 | 15.91 - .02 | 6.76 - .02 | 12.32 .48 | 53.36 .00 | 35.73 .00 |
| Dec. 4.4 | 22.01 .05 | 48.38 .05 | 7.68 .04 | 15.86 .06 | 6.73 .05 | 12.89 .64 | 53.35 - .03 | 35.71 - .03 |
| 14.3 | 21.95 - .07 | 48.32 - .07 | 7.62 - .07 | 15.78 - .10 | 6.67 - .07 | 13.61 + .80 | 53.30 - .07 | 35.67 - .06 |
| 24.3 | 21.87 .09 | 48.24 .09 | 7.54 .09 | 15.67 .14 | 6.59 .10 | 14.49 .25 | 53.21 .10 | 35.60 .08 |
| 34.3 | 21.77 - .11 | 48.14 - .11 | 7.44 - .11 | 15.52 - .17 | 6.46 - .14 | 15.51 +1.07 | 53.10 - .13 | 35.51 - .10 |
| Mean Solar Date. | δ Hydri. | δ Ceti. | μ Hydri. | θ Persei. | σ Arietis. | 47 Cophei. | ϵ Arietis. | β Persei. (Algol.) |
| | $159^{\circ} 9'$ h m 2 19 | $90^{\circ} 9'$ h m 2 33 | $169^{\circ} 35'$ h m 2 33 | $41^{\circ} 14'$ h m 2 36 | $75^{\circ} 22'$ h m 2 45 | $11^{\circ} 1'$ h m 2 51 | $69^{\circ} 6'$ h m 2 52 | $49^{\circ} 28'$ h m 3 1 |
| (Dec.30.3) | 50.36 - .52 | 53.44 - .09 | 63.91 -1.10 | 44.96 - .15 | 28.13 - .06 | 37.45 - .74 | 58.44 - .07 | 4.31 - .09 |
| Jan. 9.3 | 49.83 .54 | 53.34 .10 | 62.77 1.17 | 44.79 .19 | 28.05 .10 | 36.66 .85 | 58.35 .10 | 4.20 .13 |
| 19.3 | 49.28 .56 | 53.23 .12 | 61.56 1.21 | 44.58 .22 | 27.93 .12 | 35.76 .95 | 58.23 .12 | 4.04 .17 |
| 29.2 | 48.71 .57 | 53.10 .13 | 60.34 1.22 | 44.35 .23 | 27.80 .13 | 34.75 1.02 | 58.10 .14 | 3.85 .19 |
| Feb. 8.2 | 48.15 .58 | 52.96 .14 | 59.13 1.20 | 44.11 .24 | 27.66 .14 | 33.71 1.05 | 57.95 .15 | 3.65 .20 |
| 18.2 | 47.61 - .53 | 52.81 - .15 | 57.94 -1.17 | 43.86 - .25 | 27.51 - .15 | 32.65 -1.07 | 57.79 - .16 | 3.44 - .21 |
| Sept.25.6 | 52.90 + .37 | 56.11 + .19 | 65.73 + .72 | 48.34 + .30 | 30.86 + .21 | 43.66 + .21 | 61.18 + .21 | 7.20 + .27 |
| Oct. 5.6 | 53.23 .28 | 56.29 .17 | 66.36 .54 | 48.62 .25 | 31.06 .19 | 44.51 .79 | 61.38 .22 | 7.55 .25 |
| 15.5 | 53.46 .18 | 56.45 .14 | 66.80 .33 | 48.85 .20 | 31.24 .16 | 45.24 .64 | 61.58 .18 | 7.79 .22 |
| 25.5 | 53.58 + .07 | 56.57 + .11 | 67.02 + .11 | 49.03 + .16 | 31.38 + .13 | 45.79 + .49 | 61.75 + .15 | 7.99 + .18 |
| Nov. 4.5 | 53.59 - .05 | 56.67 .08 | 67.01 - .12 | 49.17 .12 | 31.50 .10 | 46.18 .31 | 61.87 .11 | 8.15 .14 |
| 14.5 | 53.49 .15 | 56.74 .05 | 66.77 .34 | 49.27 .08 | 31.59 .07 | 46.40 + .13 | 61.97 .08 | 8.27 .10 |
| 24.4 | 53.29 .25 | 56.78 + .02 | 66.32 .55 | 49.32 + .03 | 31.65 .04 | 46.46 - .05 | 62.03 .05 | 8.36 .06 |
| Dec. 4.4 | 53.00 .34 | 56.78 - .01 | 65.67 .74 | 49.32 - .02 | 31.66 + .01 | 46.31 .26 | 62.07 + .02 | 8.40 + .02 |
| 14.4 | 52.62 - .42 | 56.76 - .03 | 64.84 - .91 | 49.27 - .08 | 31.66 - .02 | 45.95 - .45 | 62.06 - .02 | 8.39 - .02 |
| 24.4 | 52.17 .48 | 56.72 .06 | 63.86 1.03 | 49.16 .12 | 31.62 .05 | 45.41 .62 | 62.03 .05 | 8.35 .07 |
| 34.3 | 51.67 - .53 | 56.64 - .09 | 62.77 -1.13 | 49.03 - .16 | 31.55 - .08 | 44.71 - .77 | 61.96 - .08 | 8.25 - .11 |

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | ρ Octantis. S. P. | ϵ Hydri. | f Tauri. | γ Camelop. | γ Hydri. | ϵ Persei. | Δ^1 Tauri. | σ Persei. |
|------------------------|---------------------------|----------------------------|-------------------------|------------------------|-------------------------|------------------------|------------------------|-----------------------|
| | 185° 54' h m 3 18 | 167° 47' h m 3 18 | 77° 26' h m 3 24 | 19° 0' h m 3 38 | 164° 34' h m 3 48 | 50° 18' h m 3 50 | 68° 13' h m 3 58 | 42° 35' h m 4 0 |
| (Dec. 30.4) | 0.19 +2.16 | 46.23 - .85 | 51.13 - .06 | 52.11 - .37 | 60.32 - .61 | 32.29 - .06 | 15.06 - .03 | 45.01 - .06 |
| Jan. 9.3 | 2.41 2.28 | 45.33 .95 | 51.06 .08 | 51.79 .37 | 59.67 .69 | 32.21 .10 | 15.01 .07 | 44.93 .11 |
| 19.3 | 4.76 2.41 | 44.34 1.03 | 50.97 .11 | 51.37 .46 | 58.94 .77 | 32.09 .14 | 14.93 .10 | 44.79 .16 |
| 29.3 | 7.23 2.47 | 43.28 1.07 | 50.84 .13 | 50.87 .53 | 58.13 .84 | 31.93 .17 | 14.81 .13 | 44.62 .19 |
| Feb. 8.3 | 9.70 2.48 | 42.21 1.08 | 50.70 .14 | 50.32 .57 | 57.27 .88 | 31.75 .19 | 14.66 .16 | 44.40 .23 |
| 18.3 | 12.18 +2.43 | 41.13 -1.07 | 50.55 - .15 | 49.74 - .59 | 56.38 - .89 | 31.54 - .21 | 14.50 - .17 | 44.16 - .25 |
| 28.2 | 14.55 +2.31 | 40.07 -1.03 | 50.39 - .16 | 49.14 - .60 | 55.49 - .88 | 31.32 - .22 | 14.33 - .18 | 43.90 - .27 |
| Oct. 5.6 | 7.68 -1.08 | 46.30 + .85 | 53.76 + .33 | 56.54 + .61 | 59.50 + .61 | 35.16 + .32 | 17.58 + .26 | 47.99 + .34 |
| 15.6 | 6.75 .75 | 46.86 .47 | 53.98 .19 | 57.12 .55 | 60.05 .48 | 35.46 .27 | 17.83 .24 | 48.32 .32 |
| 25.5 | 6.18 - .37 | 47.24 + .98 | 54.15 + .16 | 57.63 + .46 | 60.47 + .35 | 35.71 + .23 | 18.06 + .21 | 48.62 + .29 |
| Nov. 4.5 | 6.02 + .06 | 47.43 + .10 | 54.31 .14 | 58.04 .37 | 60.76 .21 | 35.93 .20 | 18.25 .19 | 48.89 .25 |
| 14.5 | 6.31 .50 | 47.43 - .09 | 54.44 .12 | 58.37 .27 | 60.89 + .06 | 36.12 .17 | 18.43 .16 | 49.11 .20 |
| 24.5 | 7.02 .91 | 47.24 .98 | 54.54 .08 | 58.58 .15 | 60.88 - .03 | 36.27 .13 | 18.57 .12 | 49.29 .15 |
| Dec. 4.4 | 8.12 1.30 | 46.87 .46 | 54.59 .04 | 58.67 + .04 | 60.73 .22 | 36.38 .08 | 18.66 .08 | 49.41 .10 |
| 14.4 | 9.61 +1.06 | 46.33 - .63 | 54.62 + .01 | 58.66 - .07 | 60.43 - .38 | 36.43 + .03 | 18.73 + .05 | 49.49 + .05 |
| 24.4 | 11.43 1.97 | 45.62 .78 | 54.61 - .02 | 58.52 .19 | 59.96 .51 | 36.44 - .02 | 18.75 + .01 | 49.50 - .01 |
| 34.4 | 13.50 +2.19 | 44.78 - .90 | 54.57 - .06 | 58.27 - .39 | 59.40 - .62 | 36.40 - .07 | 18.74 - .04 | 49.46 - .07 |
| Mean Solar Date. | σ^1 Eridani. | η Urs. Min., S. P. | δ Mensæ. | m Persei. | τ Tauri. | ι Tauri. | ζ Aurigæ. | β Eridani. |
| | 97° 7' h m 4 6 | 346° 0' h m 4 20 | 170° 28' h m 4 25 | 47° 10' h m 4 25 | 67° 15' h m 4 35 | 71° 21' h m 4 44 | 49° 5' h m 4 54 | 95° 14' h m 5 2 |
| (Dec. 30.4) | 32.85 - .04 | 37.80 + .48 | 30.39 - .88 | 44.92 - .03 | 42.26 .00 | 59.99 + .01 | 51.78 + .02 | 29.78 + .01 |
| Jan. 9.4 | 32.80 .07 | 38.34 .63 | 29.42 1.06 | 44.87 .07 | 42.24 - .04 | 59.98 - .03 | 51.77 - .03 | 29.77 - .03 |
| 19.4 | 32.72 .10 | 39.04 .75 | 28.27 1.23 | 44.78 .11 | 42.18 .08 | 59.94 .07 | 51.72 .08 | 29.73 .07 |
| 29.3 | 32.61 .13 | 39.86 .85 | 26.97 1.35 | 44.64 .16 | 42.08 .12 | 59.85 .11 | 51.60 .13 | 29.64 .10 |
| Feb. 8.3 | 32.46 .15 | 40.74 .92 | 25.58 1.42 | 44.46 .20 | 41.95 .15 | 59.72 .14 | 51.45 .18 | 29.52 .13 |
| 18.3 | 32.30 - .17 | 41.69 + .98 | 24.13 -1.47 | 44.24 - .23 | 41.79 - .16 | 59.57 - .16 | 51.25 - .21 | 29.38 - .15 |
| 28.3 | 32.14 .18 | 42.65 .95 | 22.65 1.47 | 44.02 .23 | 41.62 .17 | 59.41 .17 | 51.03 .22 | 29.21 .17 |
| Mar. 10.2 | 31.97 - .17 | 43.59 + .93 | 21.19 -1.42 | 43.79 - .22 | 41.44 - .18 | 59.23 - .18 | 50.81 - .21 | 29.03 - .18 |
| Oct. 15.6 | 35.13 + .22 | 37.37 - .72 | 26.25 + .89 | 47.94 + .32 | 44.81 + .29 | 62.41 + .27 | 54.55 + .34 | 31.69 + .24 |
| 25.6 | 35.34 + .19 | 36.71 - .60 | 27.04 + .69 | 48.25 + .29 | 45.08 + .25 | 62.67 + .25 | 54.88 + .31 | 31.93 + .23 |
| Nov. 4.6 | 35.52 .16 | 36.17 .46 | 27.62 .47 | 48.53 .26 | 45.31 .22 | 62.91 .23 | 55.18 .29 | 32.16 .21 |
| 14.5 | 35.68 .13 | 35.79 .31 | 27.98 + .24 | 48.77 .22 | 45.52 .19 | 63.13 .20 | 55.46 .26 | 32.36 .19 |
| 24.5 | 35.80 .10 | 35.55 - .15 | 28.09 - .02 | 48.98 .18 | 45.70 .16 | 63.31 .16 | 55.70 .21 | 32.55 .16 |
| Dec. 4.5 | 35.89 .07 | 35.50 + .03 | 27.94 .28 | 49.13 .13 | 45.84 .12 | 63.45 .13 | 55.88 .16 | 32.69 .13 |
| 14.5 | 35.93 + .03 | 35.61 + .20 | 27.54 - .52 | 49.23 + .08 | 45.94 + .08 | 63.57 + .09 | 56.03 + .12 | 32.80 + .09 |
| 24.4 | 35.95 .00 | 35.91 .38 | 26.90 .75 | 49.29 + .03 | 46.00 + .03 | 63.64 + .05 | 56.12 + .08 | 32.87 + .05 |
| 34.4 | 35.92 - .04 | 36.37 + .54 | 26.04 - .97 | 49.28 - .03 | 46.01 - .02 | 63.66 .00 | 56.15 .00 | 32.89 .00 |

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | τ Orionis. | χ Aurigæ. | Groombr. 944. | κ Orionis. | ν Aurigæ. | δ Doradus. | β Aurigæ. | θ Aurigæ. |
|------------------------|------------------------|------------------------|------------------------|---------------------------|------------------------|-------------------------|------------------------|-------------------------|
| | 96° 58' h m 5 12 | 57° 53' h m 5 25 | 4° 52' h m 5 27 | 99° 43' h m 5 42 | 50° 53' h m 5 43 | 155° 47' h m 5 44 | 45° 4' h m 5 51 | 52° 48' h m 5 52 |
| (Dec 30.5) | 19.18 + .02 | 38.35 + .05 | 16.07 - .20 | 35.62 + .04 | 56.44 + .03 | 38.08 - .13 | 32.49 + .09 | 17.72 + .06 |
| Jan. 9.4 | 19.18 - .02 | 38.38 + .01 | 15.63 .67 | 35.65 .00 | 56.49 + .02 | 37.90 .22 | 32.55 + .03 | 17.78 + .03 |
| 19.4 | 19.15 .06 | 38.37 - .04 | 14.72 1.14 | 35.62 - .04 | 56.49 - .04 | 37.63 .31 | 32.55 - .03 | 17.78 - .02 |
| 29.4 | 19.07 .10 | 38.30 .09 | 13.35 1.57 | 35.57 .08 | 56.42 .09 | 37.27 .40 | 32.48 .09 | 17.73 .07 |
| Feb. 8.3 | 18.96 .13 | 38.18 .14 | 11.58 1.92 | 35.46 .12 | 56.32 .13 | 36.84 .46 | 32.37 .15 | 17.64 .12 |
| 18.3 | 18.81 - .15 | 38.02 - .17 | 9.51 - 2.18 | 35.32 - .15 | 56.16 - .18 | 36.35 - .51 | 32.19 - .20 | 17.49 - .17 |
| 28.3 | 18.54 .17 | 37.85 .19 | 7.22 2.35 | 35.17 .17 | 55.96 .21 | 35.82 .53 | 31.98 .23 | 17.31 .20 |
| Mar. 10.3 | 18.46 .18 | 37.65 .20 | 4.82 2.41 | 34.99 .18 | 55.75 .22 | 35.25 .57 | 31.75 .24 | 17.10 .20 |
| 20.3 | 18.28 - .17 | 37.44 - .21 | 2.40 - 2.40 | 34.81 - .17 | 55.53 - .21 | 34.68 - .55 | 31.50 - .25 | 16.90 - .18 |
| | | | | | | | | |
| Oct. 25.6 | 21.45 + .24 | 41.07 + .31 | 26.33 + 2.64 | 37.46 + .26 | 59.19 + .37 | 36.92 + .47 | 35.32 + .39 | 20.39 + .35 |
| Nov. 4.6 | 21.48 .22 | 41.37 .28 | 28.81 2.31 | 37.71 .25 | 59.54 .33 | 37.36 .40 | 35.70 .36 | 20.73 .33 |
| 14.6 | 21.69 .20 | 41.64 .26 | 30.94 1.97 | 37.95 .23 | 59.85 .30 | 37.73 .32 | 36.05 .33 | 21.04 .30 |
| 24.5 | 21.88 .17 | 41.89 .23 | 32.75 1.60 | 38.17 .20 | 60.14 .27 | 38.01 .23 | 36.37 .29 | 21.33 .27 |
| Dec. 4.5 | 22.04 .13 | 42.11 .19 | 34.12 1.14 | 38.34 .16 | 60.39 .23 | 38.20 .14 | 36.64 .25 | 21.59 .24 |
| 14.5 | 22.14 + .09 | 42.27 + .14 | 35.03 + .66 | 38.49 + .12 | 60.59 + .18 | 38.29 + .04 | 36.87 + .20 | 21.80 + .19 |
| 24.5 | 22.22 .05 | 42.39 .10 | 35.43 + .15 | 38.59 .08 | 60.73 .13 | 38.28 - .06 | 37.04 .14 | 21.95 .13 |
| 34.4 | 22.25 + .01 | 42.47 + .05 | 35.34 - .35 | 38.64 + .03 | 60.83 + .07 | 38.16 - .16 | 37.15 + .08 | 22.06 + .06 |
| | | | | | | | | |
| Mean Solar Date. | η Geminor. | ψ Aurigæ. | ν Geminor. | χ Draconis, S. P. | ϵ Geminor. | ψ Aurigæ. | θ Geminor. | ζ Mensæ. |
| | 67° 28' h m 6 8 | 40° 39' h m 6 16 | 69° 43' h m 6 22 | 342° 41' h m 6 22 | 64° 46' h m 6 37 | 46° 19' h m 6 38 | 55° 54' h m 6 45 | 170° 42' h m 6 49 |
| (Dec.30.5) | 18.23 + .09 | 30.86 + .14 | 29.77 + .12 | 57.02 + .03 | 13.88 + .12 | 53.43 + .16 | 36.72 + .14 | 16.43 - .15 |
| Jan. 9.5 | 18.30 + .05 | 30.97 + .06 | 29.86 + .06 | 57.11 .15 | 13.98 .08 | 53.56 .09 | 36.84 .10 | 16.15 .41 |
| 19.4 | 18.33 .00 | 30.99 - .01 | 29.89 .00 | 57.32 .29 | 14.04 + .03 | 53.61 + .02 | 36.92 + .04 | 15.61 .66 |
| 29.4 | 18.29 - .05 | 30.95 .08 | 29.88 - .04 | 57.69 .43 | 14.04 - .02 | 53.61 - .04 | 36.92 - .02 | 14.83 .88 |
| Feb. 8.4 | 18.22 .09 | 30.84 .13 | 29.82 .08 | 58.17 .53 | 13.99 .07 | 53.54 .10 | 36.88 .07 | 13.65 1.08 |
| 18.4 | 18.11 - .13 | 30.69 - .18 | 29.72 - .12 | 58.74 + .62 | 13.89 - .12 | 53.42 - .15 | 36.78 - .12 | 12.68 - 1.25 |
| 28.3 | 17.96 .18 | 30.47 .23 | 29.58 .15 | 59.42 .71 | 13.76 .15 | 53.25 .19 | 36.61 .16 | 11.36 1.38 |
| Mar. 10.3 | 17.80 .18 | 30.22 .26 | 29.42 .17 | 60.16 .74 | 13.60 .17 | 53.05 .21 | 36.46 .19 | 9.93 1.48 |
| 20.3 | 17.61 .18 | 29.95 .27 | 29.24 .18 | 60.90 .76 | 13.42 .18 | 52.82 .23 | 36.27 .20 | 8.43 1.53 |
| 30.2 | 17.44 .17 | 29.68 .26 | 29.07 .17 | 61.67 .76 | 13.24 .18 | 52.58 .24 | 36.07 .21 | 6.88 1.54 |
| Apr. 9.2 | 17.26 - .16 | 29.42 - .21 | 28.90 - .15 | 62.43 + .74 | 13.06 - .17 | 52.34 - .23 | 35.86 - .20 | 5.34 - 1.50 |
| | | | | | | | | |
| Nov. 14.6 | 21.11 + .28 | 34.46 + .39 | 32.53 + .29 | 57.20 - .57 | 16.69 + .31 | 56.70 + .37 | 39.71 + .33 | 9.01 + .99 |
| 24.6 | 21.38 .25 | 34.83 .35 | 32.81 .26 | 56.68 .46 | 16.99 .28 | 57.06 .34 | 40.03 .31 | 9.88 .75 |
| Dec. 4.6 | 21.62 .22 | 35.16 .30 | 33.06 .23 | 56.27 .34 | 17.26 .25 | 57.39 .30 | 40.33 .28 | 10.51 .52 |
| 14.5 | 21.81 + .18 | 35.43 + .24 | 33.27 + .19 | 55.99 - .21 | 17.49 + .21 | 57.67 + .26 | 40.59 + .24 | 10.93 + .28 |
| 24.5 | 21.97 .13 | 35.64 .18 | 33.44 .14 | 55.84 - .08 | 17.68 .17 | 57.91 .20 | 40.81 .19 | 11.08 + .01 |
| 34.5 | 22.08 + .06 | 35.79 + .12 | 33.56 + .09 | 55.84 + .07 | 17.83 + .12 | 58.03 + .14 | 40.98 + .13 | 10.95 - .27 |

ADDITIONAL FIXED STARS, 1891.

369

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | ζ Geminor. | 63 Aurigæ. | 25 Camelop. | γ ² Volantis. | β Can. Min. | 26 Lyncis. | Groombr. 1374. | ω ¹ Cancri. |
|------------------------|------------------------|------------------------|------------------------|--------------------------|------------------------|-----------------------|-----------------------------------|------------------------|
| | 69° 16' h m 6 57 | 50° 30' h m 7 4 | 7° 23' h m 7 8 | 160° 19' h m 7 9 | 81° 29' h m 7 21 | 42° 9' h m 7 46 | 15° 48' h m 7 47 | 64° 19' h m 7 54 |
| Dec. 30.5 | 39.01 + .14 | 9.96 + .19 | 14.30 + .70 | 44.12 + .06 | 14.73 + .14 | 47.09 + .96 | 10.94 + .54 | 20.49 + .21 |
| Jan. 9.5 | 39.13 .10 | 10.12 .13 | 14.83 .36 | 44.11 - .07 | 14.86 .11 | 47.32 .19 | 11.39 .35 | 20.68 .16 |
| 19.5 | 39.21 + .05 | 10.21 + .06 | 15.01 + .01 | 43.97 .20 | 14.96 .07 | 47.47 .12 | 11.64 .17 | 20.82 .11 |
| 29.4 | 39.22 .00 | 10.24 .00 | 14.86 - .33 | 43.72 .32 | 14.99 + .01 | 47.57 + .05 | 11.75 + .02 | 20.90 + .05 |
| Feb. 8.4 | 39.20 - .05 | 10.20 - .06 | 14.35 .66 | 43.31 .42 | 14.97 - .04 | 47.58 - .02 | 11.69 - .14 | 20.92 .00 |
| 18.4 | 39.12 - .10 | 10.12 - .11 | 13.54 - .94 | 42.88 - .51 | 14.92 - .08 | 47.52 - .09 | 11.46 - .30 | 20.89 - .05 |
| 28.4 | 38.99 .13 | 9.98 .16 | 12.47 1.18 | 42.32 .59 | 14.82 .12 | 47.40 .15 | 11.09 .43 | 20.82 .10 |
| Mar. 10.3 | 38.86 .15 | 9.80 .19 | 11.19 1.37 | 41.69 .65 | 14.69 .14 | 47.23 .19 | 10.60 .54 | 20.71 .14 |
| 20.3 | 38.69 .17 | 9.60 .21 | 9.74 1.47 | 41.02 .68 | 14.54 .16 | 47.03 .22 | 10.01 .63 | 20.55 .16 |
| 30.3 | 38.52 .18 | 9.38 .21 | 8.25 1.52 | 40.33 .70 | 14.38 .17 | 46.79 .25 | 9.35 .67 | 20.39 .17 |
| Apr. 9.2 | 38.34 - .17 | 9.17 - .20 | 6.71 - 1.52 | 39.63 - .69 | 14.21 - .16 | 46.54 - .24 | 8.67 - .68 | 20.22 - .16 |
| 19.2 | 38.17 - .15 | 8.98 - .17 | 5.22 - 1.47 | 38.96 - .65 | 14.05 - .14 | 46.30 - .21 | 7.99 - .67 | 20.06 - .14 |
| Nov. 24.6 | 41.94 + .30 | 13.35 + .34 | 23.81 + 1.68 | 42.45 + .47 | 17.33 + .26 | 50.50 + .44 | 16.22 + .23 | 23.31 + .34 |
| Dec. 4.6 | 42.22 .26 | 13.68 .31 | 25.39 1.48 | 42.87 .37 | 17.59 .25 | 50.92 .40 | 17.11 .84 | 23.64 .31 |
| 14.6 | 42.45 + .22 | 13.96 + .27 | 26.77 + 1.22 | 43.19 + .26 | 17.84 + .23 | 51.30 + .35 | 17.91 + .73 | 23.94 + .28 |
| 24.5 | 42.66 .18 | 14.23 .22 | 27.83 .20 | 43.39 .14 | 18.06 .19 | 51.63 .30 | 18.57 .20 | 24.21 .25 |
| 34.5 | 42.82 + .13 | 14.43 + .17 | 28.57 + .58 | 43.46 + .01 | 18.22 + .13 | 51.91 + .24 | 19.11 + .47 | 24.44 + .20 |
| Mean Solar Date. | ζ ¹ Cancri. | β Cancri. | 30 Monocerotis. | θ Chamæleontis. | σ Hydræ. | γ Cancri. | α ² Cancri. (mean.) | θ Hydræ. |
| | 72° 1' h m 8 5 | 80° 29' h m 8 10 | 93° 33' h m 8 20 | 167° 8' h m 8 23 | 86° 17' h m 8 33 | 68° 8' h m 8 36 | 59° 0' h m 8 47 | 87° 14' h m 9 8 |
| (Dec. 30.6) | 57.89 + .19 | 36.47 + .20 | 13.08 + .20 | 59.49 + .30 | 3.92 + .20 | 58.90 + .24 | 35.88 + .27 | 41.72 + .24 |
| Jan. 9.5 | 58.07 .16 | 36.65 .16 | 13.26 .16 | 59.72 + .15 | 4.11 .18 | 59.12 .20 | 36.13 .22 | 41.95 .21 |
| 19.5 | 58.22 .12 | 36.80 .11 | 13.39 .11 | 59.80 - .01 | 4.28 .14 | 59.30 .16 | 36.33 .17 | 42.14 .16 |
| 29.5 | 58.31 .07 | 36.88 .06 | 13.48 .06 | 59.68 .20 | 4.38 .08 | 59.42 .10 | 36.47 .11 | 42.27 .11 |
| Feb. 8.5 | 58.35 + .01 | 36.92 + .01 | 13.51 + .01 | 59.38 .38 | 4.44 + .03 | 59.49 + .04 | 36.55 .06 | 42.37 .06 |
| 18.4 | 58.33 - .04 | 36.90 - .04 | 13.50 - .03 | 58.92 - .54 | 4.44 - .02 | 59.50 - .01 | 36.59 + .01 | 42.41 + .01 |
| 28.4 | 58.26 .08 | 36.84 .08 | 13.45 .07 | 58.28 .70 | 4.39 .06 | 59.47 .06 | 36.56 - .05 | 42.39 - .03 |
| Mar. 10.4 | 58.16 .11 | 36.75 .11 | 13.35 .11 | 57.52 .81 | 4.32 .09 | 59.39 .10 | 36.48 .10 | 42.35 .07 |
| 20.4 | 58.03 .14 | 36.62 .13 | 13.23 .13 | 56.67 .20 | 4.21 .12 | 59.28 .13 | 36.37 .13 | 42.26 .10 |
| 30.3 | 57.88 .15 | 36.48 .14 | 13.09 .15 | 55.73 .27 | 4.08 .14 | 59.14 .15 | 36.22 .15 | 42.16 .12 |
| Apr. 9.3 | 57.72 - .16 | 36.33 - .15 | 12.93 - .16 | 54.73 - 1.01 | 3.93 - .15 | 58.99 - .16 | 36.07 - .16 | 42.03 - .14 |
| 19.3 | 57.56 .15 | 36.17 .15 | 12.77 .15 | 53.71 1.03 | 3.78 .15 | 58.83 .15 | 35.90 .17 | 41.89 .14 |
| 29.2 | 57.41 .14 | 36.02 .14 | 12.63 .14 | 52.67 1.03 | 3.64 .14 | 58.68 .14 | 35.73 .16 | 41.76 .13 |
| May 9.2 | 57.28 - .12 | 35.89 - .12 | 12.49 - .12 | 51.65 - 1.01 | 3.50 - .12 | 58.54 - .12 | 35.58 - .15 | 41.62 - .12 |

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | β Argus. | α Lynxis. | 10 Leonis Minoris. | σ Leonis. | ζ Chamaeleontis. | 19 Leonis Minoris. | π Leonis. | λ Ursae Ma- joris. |
|------------------------|--------------------------|----------------------------|--------------------------|----------------------------|-------------------------|--------------------------|-------------------------|-------------------------------|
| | 159° 16' h m 9 11 | 55° 9' h m 9 14 | 53° 7' h m 9 27 | 79° 37' h m 9 35 | 170° 27' h m 9 37 | 48° 26' h m 9 51 | 81° 26' h m 9 54 | 46° 33' h m 10 10 |
| (Dec. 30.6) | 62.55 + .40 | 24.99 + .30 | 32.91 + .32 | 19.97 + .96 | 10.35 + .80 | 0.63 + .36 | 27.10 + .27 | 31.38 + .39 |
| Jan. 9.6 | 62.89 .98 | 25.28 .25 | 33.21 .98 | 20.22 .23 | 11.06 .60 | 0.97 .32 | 27.36 .25 | 31.75 .35 |
| 19.6 | 63.11 .16 | 25.51 .20 | 33.48 .23 | 20.44 .20 | 11.56 .39 | 1.27 .27 | 27.60 .21 | 32.08 .30 |
| 29.5 | 63.22 + .05 | 25.70 .15 | 33.67 .17 | 20.61 .15 | 11.83 + .15 | 1.50 .20 | 27.78 .16 | 32.34 .24 |
| Feb. 8.5 | 63.20 - .07 | 25.82 .09 | 33.81 .11 | 20.73 .10 | 11.86 - .09 | 1.67 .14 | 27.92 .11 | 32.55 .17 |
| 18.5 | 63.07 - .18 | 25.87 + .03 | 33.89 + .05 | 20.80 + .05 | 11.65 - .31 | 1.78 + .08 | 28.01 + .06 | 32.67 + .10 |
| 28.5 | 62.83 .29 | 25.88 - .02 | 33.91 - .01 | 20.82 .00 | 11.24 .52 | 1.83 + .02 | 28.05 + .02 | 32.75 + .04 |
| Mar. 10.4 | 62.49 .38 | 25.83 .07 | 33.88 .06 | 20.80 - .05 | 10.60 .72 | 1.82 - .04 | 28.05 - .02 | 32.76 - .02 |
| 20.4 | 62.08 .45 | 25.74 .11 | 33.78 .11 | 20.73 .08 | 9.79 .88 | 1.75 .09 | 28.00 .06 | 32.71 .08 |
| 30.4 | 61.60 .51 | 25.60 .14 | 33.66 .14 | 20.64 .10 | 8.84 1.02 | 1.63 .13 | 27.93 .09 | 32.61 .12 |
| Apr. 9.3 | 61.07 - .55 | 25.45 - .16 | 33.51 - .16 | 20.53 - .12 | 7.74 -1.15 | 1.49 - .16 | 27.83 - .11 | 32.48 - .15 |
| 19.3 | 60.51 .57 | 25.28 .17 | 33.35 .17 | 20.40 .13 | 6.55 1.22 | 1.32 .18 | 27.71 .19 | 32.32 .18 |
| 29.3 | 59.93 .58 | 25.10 .17 | 33.17 .17 | 20.27 .13 | 5.29 1.26 | 1.14 .18 | 27.59 .19 | 32.13 .19 |
| May 9.3 | 59.34 .58 | 24.93 .16 | 33.00 .16 | 20.14 .12 | 3.99 1.32 | 0.96 .18 | 27.47 .12 | 31.94 .18 |
| 19.2 | 58.76 - .57 | 24.78 - .14 | 32.84 - .15 | 20.02 - .11 | 2.66 -1.34 | 0.78 - .17 | 27.34 - .12 | 31.76 - .16 |
| Mean Solar Date. | μ Hydræ. | β Leonis Minoris. | α Antilæ. | β Octantis, S. P. | 41 Leonis Minoris. | δ Chamaeleontis. | 46 Leonis Minoris. | Groombr. 1706. |
| | 106° 17' h m 10 20 | 52° 44' h m 10 21 | 120° 31' h m 10 22 | 188° 3' h m 10 34 | 66° 14' h m 10 37 | 169° 58' h m 10 44 | 55° 12' h m 10 47 | 11° 39' h m 10 51 |
| Jan. 19.6 | 49.50 + .24 | 35.40 + .29 | 10.27 + .22 | 45.25 - .61 | 29.71 + .24 | 50.01 + .75 | 13.39 + .30 | 17.58 + .28 |
| 29.6 | 49.71 .18 | 35.66 .23 | 10.47 .17 | 44.74 .40 | 29.94 .21 | 50.66 .55 | 13.67 .25 | 18.47 .20 |
| Feb. 8.6 | 49.86 .12 | 35.86 .16 | 10.62 .12 | 44.46 - .16 | 30.14 .17 | 51.11 .34 | 13.88 .19 | 19.18 .61 |
| 18.5 | 49.96 .07 | 35.99 .11 | 10.72 .08 | 44.43 + .08 | 30.28 .12 | 51.34 + .13 | 14.05 .14 | 19.69 .41 |
| 28.5 | 50.01 + .03 | 36.08 + .06 | 10.78 + .03 | 44.62 .31 | 30.38 .07 | 51.37 - .07 | 14.17 .08 | 19.99 + .19 |
| Mar. 10.5 | 50.02 - .01 | 36.11 .00 | 10.77 - .02 | 45.05 + .56 | 30.41 + .02 | 51.20 - .27 | 14.22 + .03 | 20.07 - .02 |
| 20.4 | 50.00 .05 | 36.08 - .05 | 10.73 .06 | 45.74 .79 | 30.41 - .03 | 50.84 .46 | 14.22 - .02 | 19.95 .22 |
| 30.4 | 49.93 .08 | 36.00 .09 | 10.65 .10 | 46.62 .98 | 30.36 .06 | 50.29 .64 | 14.18 .06 | 19.63 .41 |
| Apr. 9.4 | 49.84 .10 | 35.89 .12 | 10.54 .12 | 47.71 1.17 | 30.29 .08 | 49.58 .77 | 14.10 .09 | 19.13 .57 |
| 19.4 | 49.73 .11 | 35.76 .14 | 10.41 .14 | 48.96 1.34 | 30.20 .10 | 48.75 .89 | 14.00 .12 | 18.49 .70 |
| 29.3 | 49.62 - .12 | 35.61 - .16 | 10.26 - .15 | 50.38 +1.48 | 30.08 - .12 | 47.80 -1.00 | 13.86 - .14 | 17.74 - .79 |
| May 9.3 | 49.49 .13 | 35.44 .17 | 10.11 .15 | 51.92 1.59 | 29.95 .13 | 46.74 1.08 | 13.72 .14 | 16.91 .86 |
| 19.3 | 49.36 .13 | 35.28 .16 | 9.96 .15 | 53.55 1.67 | 29.83 .13 | 45.64 1.13 | 13.58 .15 | 16.03 .89 |
| 29.3 | 49.24 .12 | 35.13 .14 | 9.81 .14 | 55.25 1.70 | 29.70 .12 | 44.49 1.17 | 13.43 .14 | 15.14 .88 |
| June 8.2 | 49.12 - .11 | 34.99 - .12 | 9.67 - .13 | 56.95 +1.67 | 29.59 - .10 | 43.30 -1.20 | 13.29 - .13 | 14.27 - .84 |

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | η Octantis. | ρ^3 Leonis. | ψ Urs. Maj. | ν Urs. Maj. | ξ Hydræ. | χ Urs. Maj. | π Virginis. | ϵ Corvi. |
|------------------------|-------------------------|------------------------|--------------------------|-------------------------|-------------------------------|-------------------------|-----------------------------|--------------------------|
| | 174° 0' h m 10 59 | 87° 27' h m 11 1 | 44° 55' h m 11 3 | 56° 19' h m 11 12 | 121° 15' h m 11 27 | 41° 37' h m 11 40 | 82° 47' h m 11 55 | 112° 1' h m 12 4 |
| Feb. 8.6 | 73.87 + .65 | 21.11 + .15 | 33.25 + .24 | 36.49 + .21 | 39.00 + .20 | 18.86 + .30 | 17.65 + .21 | 31.47 + .23 |
| 18.6 | 74.36 + .33 | 21.25 .12 | 33.46 .18 | 36.68 .17 | 39.18 .15 | 19.13 .23 | 17.85 .18 | 31.68 .19 |
| 28.5 | 74.52 .00 | 21.36 .08 | 33.60 .11 | 36.82 .12 | 39.31 .10 | 19.32 .16 | 18.02 .14 | 31.85 .15 |
| Mar. 10.5 | 74.36 - .33 | 21.42 + .04 | 33.68 + .05 | 36.91 + .06 | 39.39 .05 | 19.45 .10 | 18.13 .10 | 31.98 .11 |
| 20.5 | 73.87 .64 | 21.44 .00 | 33.70 - .01 | 36.94 .00 | 39.42 + .01 | 19.52 + .04 | 18.20 .06 | 32.06 .07 |
| 30.4 | 73.08 - .93 | 21.42 - .03 | 33.66 - .06 | 36.92 - .04 | 39.42 - .02 | 19.53 - .02 | 18.25 + .02 | 32.10 + .03 |
| Apr. 9.4 | 72.01 1.19 | 21.38 .06 | 33.58 .10 | 36.87 .07 | 39.38 .05 | 19.48 .07 | 18.25 - .01 | 32.11 .00 |
| 19.4 | 70.70 1.42 | 21.30 .08 | 33.47 .13 | 36.79 .10 | 39.31 .08 | 19.39 .11 | 18.22 .04 | 32.09 - .03 |
| 29.4 | 69.17 1.62 | 21.22 .09 | 33.32 .16 | 36.68 .12 | 39.22 .10 | 19.26 .14 | 18.17 .06 | 32.05 .05 |
| May 9.3 | 67.46 1.78 | 21.12 .10 | 33.15 .18 | 36.55 .13 | 39.11 .12 | 19.10 .17 | 18.10 .07 | 31.98 .07 |
| 19.3 | 65.61 -1.90 | 21.02 - .11 | 32.97 - .19 | 36.41 - .14 | 38.98 - .13 | 18.92 - .18 | 18.03 - .06 | 31.90 - .09 |
| 29.3 | 63.66 1.98 | 20.91 .11 | 32.77 .19 | 36.28 .15 | 38.85 .14 | 18.74 .19 | 17.94 .09 | 31.81 .10 |
| June 8.3 | 61.65 2.00 | 20.80 .10 | 32.59 .18 | 36.12 .14 | 38.71 .14 | 18.53 .20 | 17.84 .10 | 31.70 .11 |
| 18.2 | 59.67 -1.93 | 20.71 - .08 | 32.42 - .16 | 35.99 - .12 | 38.57 - .13 | 18.34 - .19 | 17.74 - .10 | 31.59 - .10 |
| Mean Solar Date. | 2 Can. Ven. | 6 Urs. Min. | δ^2 Corvi. | β Can. Ven. | γ Virginis, (mean.) | 31 Comæ Berenices. | γ Cassiop., S. P. | 43 Cephei, S. P. |
| | 48° 44' h m 12 10 | 1° 42' h m 12 14 | 105° 55' h m 12 24 | 48° 3' h m 12 28 | 90° 51' h m 12 36 | 61° 52' h m 12 46 | 330° 8' h m 12 50 | 355° 40' h m 12 53 |
| Feb. 8.6 | 40.70 + .28 | 58.19 +5.75 | 13.85 + .24 | 34.75 + .31 | 8.49 + .24 | 23.89 + .29 | 5.33 - .32 | 41.62 -2.45 |
| 18.6 | 40.96 .24 | 63.44 4.65 | 14.07 .20 | 35.04 .26 | 8.72 .21 | 24.16 .25 | 5.04 .25 | 39.37 2.05 |
| 28.6 | 41.18 .19 | 67.50 3.41 | 14.25 .16 | 35.28 .21 | 8.90 .17 | 24.39 .20 | 4.84 .18 | 37.53 1.63 |
| Mar. 10.5 | 41.34 .13 | 70.27 2.06 | 14.39 .13 | 35.46 .15 | 9.06 .13 | 24.57 .16 | 4.69 .11 | 36.12 1.16 |
| 20.5 | 41.44 .08 | 71.63 + .66 | 14.51 .09 | 35.58 .10 | 9.17 .10 | 24.71 .11 | 4.61 - .04 | 35.21 .64 |
| 30.5 | 41.49 + .03 | 71.58 - .73 | 14.57 + .05 | 35.66 + .05 | 9.26 + .07 | 24.79 + .07 | 4.60 + .04 | 34.85 - .06 |
| Apr. 9.5 | 41.50 - .02 | 70.17 2.05 | 14.60 + .02 | 35.68 .00 | 9.30 + .03 | 24.85 + .03 | 4.70 .13 | 35.06 + .46 |
| 19.4 | 41.46 .06 | 67.47 3.28 | 14.60 - .01 | 35.66 - .04 | 9.31 .00 | 24.86 - .01 | 4.87 .21 | 35.78 .97 |
| 29.4 | 41.39 .09 | 63.60 4.35 | 14.59 .03 | 35.60 .08 | 9.30 - .02 | 24.84 .04 | 5.11 .29 | 37.01 1.46 |
| May 9.4 | 41.28 .12 | 58.76 5.25 | 14.54 .06 | 35.51 .11 | 9.27 .04 | 24.79 .06 | 5.45 .36 | 38.71 1.88 |
| 19.4 | 41.15 - .14 | 53.09 -5.97 | 14.47 - .07 | 35.38 - .14 | 9.22 - .06 | 24.73 - .08 | 5.84 + .42 | 40.77 +2.23 |
| 29.3 | 41.00 .15 | 46.81 6.47 | 14.40 .08 | 35.24 .15 | 9.15 .07 | 24.63 .10 | 6.28 .46 | 43.18 2.51 |
| June 8.3 | 40.84 .16 | 40.15 6.76 | 14.31 .09 | 35.09 .16 | 9.07 .08 | 24.53 .11 | 6.76 .51 | 45.80 2.71 |
| 18.3 | 40.68 - .15 | 33.29 -6.88 | 14.21 - .10 | 34.92 - .16 | 8.98 - .08 | 24.42 - .10 | 7.30 + .56 | 48.60 +2.84 |

**APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
FOR THE UPPER TRANSIT AT WASHINGTON.**

| Mean Solar Date. | δ Muscae. | ϵ Virginis. | 20 Can. Ven. | κ Octantis. | B.A.C. 4536. | m Virginis. | θ Apodis. | π Hydræ. |
|------------------------|-----------------------------------|----------------------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| | $160^{\circ} 58'$ h m 12 54 | $78^{\circ} 27'$ h m 12 56 | $48^{\circ} 51'$ h m 13 12 | $175^{\circ} 14'$ h m 13 23 | $52^{\circ} 16'$ h m 13 29 | $98^{\circ} 9'$ h m 13 35 | $166^{\circ} 16'$ h m 13 54 | $116^{\circ} 9'$ h m 14 0 |
| | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ |
| Mar. 0.6 | 49.21 + .42 | 45.77 + .20 | 40.42 + .25 | 31.72 + 1.82 | 56.71 + .26 | 53.90 + .21 | 45.29 + .21 | 10.14 + .24 |
| 10.6 | 49.59 .33 | 45.95 .16 | 40.65 .21 | 33.37 1.47 | 56.95 .22 | 54.10 .19 | 46.04 .68 | 10.37 .22 |
| 20.6 | 49.87 .24 | 46.09 .12 | 40.84 .15 | 34.66 1.10 | 57.14 .17 | 54.27 .16 | 46.66 .55 | 10.59 .30 |
| 30.5 | 50.06 .14 | 46.19 .08 | 40.95 .10 | 35.57 .71 | 57.28 .12 | 54.42 .13 | 47.15 .43 | 10.76 .16 |
| Apr. 9.5 | 50.14 + .04 | 46.25 .05 | 41.04 .06 | 36.08 + .33 | 57.39 .08 | 54.53 .09 | 47.52 .30 | 10.90 .13 |
| 19.5 | 50.13 - .05 | 46.29 + .02 | 41.07 + .01 | 36.23 - .04 | 57.44 + .03 | 54.60 + .06 | 47.76 + .17 | 11.01 + .10 |
| 29.4 | 50.03 .14 | 46.29 - .01 | 41.07 - .03 | 35.99 .44 | 57.45 - .01 | 54.65 .03 | 47.87 + .04 | 11.09 .07 |
| May 9.4 | 49.85 .23 | 46.27 .03 | 41.01 .07 | 35.35 .82 | 57.43 .04 | 54.67 + .01 | 47.84 - .09 | 11.14 .04 |
| 19.4 | 49.58 .30 | 46.22 .05 | 40.93 .09 | 34.35 1.16 | 57.38 .07 | 54.66 - .02 | 47.69 .22 | 11.16 + .01 |
| 29.4 | 49.26 .38 | 46.16 .07 | 40.83 .12 | 33.03 1.47 | 57.30 .10 | 54.64 .04 | 47.41 .34 | 11.15 - .02 |
| June 8.3 | 48.86 - .42 | 46.08 - .08 | 40.70 - .14 | 31.42 - 1.77 | 57.18 - .12 | 54.59 - .06 | 47.02 - .45 | 11.12 - .05 |
| 18.3 | 48.40 .48 | 46.00 .09 | 40.54 .16 | 29.50 2.01 | 57.06 .13 | 54.53 .07 | 46.51 .55 | 11.05 .07 |
| 28.3 | 47.89 .50 | 45.89 .10 | 40.38 .17 | 27.41 2.18 | 56.92 .15 | 54.45 .09 | 45.92 .64 | 10.98 .09 |
| July 8.3 | 47.40 - .47 | 45.79 - .10 | 40.21 - .16 | 25.14 - 2.34 | 56.76 - .16 | 54.35 - .10 | 45.24 - .72 | 10.87 - .11 |
| | | | | | | | | |
| Mean Solar Date. | δ Bootis. | κ Virginis. | 4 Urs. Min. | δ Octantis. | λ Bootis. | λ Virginis. | μ Hydri, S. P. | α Apodis. |
| | $64^{\circ} 24'$ h m 14 5 | $99^{\circ} 46'$ h m 14 7 | $11^{\circ} 56'$ h m 14 9 | $173^{\circ} 10'$ h m 14 9 | $43^{\circ} 25'$ h m 14 12 | $102^{\circ} 52'$ h m 14 13 | $190^{\circ} 25'$ h m 14 33 | $168^{\circ} 35'$ h m 14 34 |
| | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ | $^{\circ}$ |
| Mar. 20.6 | 26.74 + .20 | 5.61 + .20 | 22.90 + .62 | 36.52 + 1.18 | 15.93 + .22 | 13.41 + .19 | 54.94 - .81 | 24.16 + .84 |
| 30.6 | 26.92 .16 | 5.79 .16 | 23.43 .43 | 37.58 .24 | 16.13 .18 | 13.59 .16 | 54.21 .64 | 24.93 .70 |
| Apr. 9.5 | 27.04 .12 | 5.93 .12 | 23.77 .24 | 38.40 .67 | 16.29 .13 | 13.73 .13 | 53.65 .47 | 25.56 .56 |
| 19.5 | 27.14 .08 | 6.03 .09 | 23.92 + .06 | 38.93 .40 | 16.40 .08 | 13.85 .10 | 53.27 .29 | 26.05 .41 |
| 29.5 | 27.21 .05 | 6.12 .06 | 23.80 - .12 | 39.21 + .13 | 16.46 + .03 | 13.94 .07 | 53.08 - .10 | 26.38 .25 |
| May 9.5 | 27.24 + .01 | 6.18 + .04 | 23.67 - .30 | 39.20 - .13 | 16.46 - .02 | 14.00 + .04 | 53.08 + .10 | 26.54 + .09 |
| 19.4 | 27.24 - .02 | 6.20 + .02 | 23.29 .46 | 38.93 .40 | 16.42 .06 | 14.02 + .02 | 53.29 .30 | 26.55 - .07 |
| 29.4 | 27.21 .05 | 6.20 - .01 | 22.76 .60 | 38.40 .66 | 16.35 .09 | 14.04 .00 | 53.68 .48 | 26.39 .24 |
| June 8.4 | 27.15 .07 | 6.17 .04 | 22.09 .72 | 37.60 .21 | 16.24 .13 | 14.01 - .03 | 54.25 .68 | 26.07 .39 |
| 18.3 | 27.08 .06 | 6.13 .06 | 21.32 .81 | 36.58 1.12 | 16.09 .16 | 13.97 .05 | 55.01 .83 | 25.61 .54 |
| 28.3 | 26.99 - .10 | 6.06 - .08 | 20.47 - .88 | 35.36 - 1.30 | 15.92 - .18 | 13.91 - .07 | 55.90 + .26 | 25.00 - .67 |
| July 8.3 | 26.87 .12 | 5.98 .10 | 19.55 .24 | 33.98 1.45 | 15.73 .20 | 13.82 .09 | 56.92 1.08 | 24.27 .78 |
| 18.3 | 26.74 .13 | 5.87 .11 | 18.59 .27 | 32.45 1.59 | 15.52 .21 | 13.72 .11 | 58.05 1.16 | 23.45 .86 |
| 28.2 | 26.60 - .14 | 5.75 - .12 | 17.61 - .98 | 30.80 - 1.70 | 15.30 - .22 | 13.60 - .12 | 59.23 + 1.19 | 22.55 - .22 |

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | 33 Bootis. | 47 Cephei, S. P. | γ Scorpii. | δ Bootis. | ρ Octantis. | β Cor. Bor. | γ Camelop., S. P. | δ^1 Apodis. |
|------------------------|---------------------------------|-----------------------------------|-----------------------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------------------|-----------------------------------|
| | $45^{\circ} 8'$ h m 14 34 | $348^{\circ} 59'$ h m 14 51 | $114^{\circ} 51'$ h m 14 57 | $56^{\circ} 17'$ h m 15 11 | $174^{\circ} 6'$ h m 15 18 | $60^{\circ} 31'$ h m 15 23 | $341^{\circ} 0'$ h m 15 38 | $168^{\circ} 25'$ h m 16 4 |
| Mar. 30.6 | 48.44 + .91 | 29.35 - .58 | 42.21 + .91 | 7.69 + .23 | 20.82 + 1.73 | 21.14 + .29 | 47.64 - .42 | 7.24 + 1.11 |
| Apr. 9.6 | 48.63 .16 | 28.93 .32 | 42.41 .16 | 7.90 .19 | 22.41 1.45 | 21.35 .19 | 47.29 .98 | 8.28 .98 |
| 19.5 | 48.76 .11 | 28.71 - .11 | 42.58 .16 | 8.06 .18 | 23.72 1.16 | 21.53 .16 | 47.08 .15 | 9.19 .84 |
| 29.5 | 48.84 .06 | 28.71 + .11 | 42.73 .13 | 8.19 .11 | 24.74 .85 | 21.67 .12 | 46.99 - .03 | 9.96 .69 |
| May 9.5 | 48.89 + .09 | 28.93 .33 | 42.84 .10 | 8.28 .08 | 25.42 .53 | 21.78 .09 | 47.03 + .10 | 10.57 .54 |
| 19.5 | 48.89 - .03 | 29.38 + .54 | 42.92 + .07 | 8.34 + .04 | 25.80 + .20 | 21.85 + .05 | 47.19 + .23 | 11.04 + .38 |
| 29.4 | 48.84 .07 | 30.02 .72 | 42.97 + .04 | 8.36 .00 | 25.82 - .14 | 21.89 + .02 | 47.49 .35 | 11.33 .91 |
| June 8.4 | 48.75 .10 | 30.83 .88 | 42.99 .00 | 8.34 - .04 | 25.53 .47 | 21.88 - .02 | 47.90 .47 | 11.45 + .03 |
| 18.4 | 48.64 .13 | 31.77 1.02 | 42.97 - .03 | 8.29 .07 | 24.88 .79 | 21.85 .05 | 48.43 .57 | 11.39 - .15 |
| 28.3 | 48.50 .16 | 32.88 1.14 | 42.93 .06 | 8.20 .10 | 23.96 1.07 | 21.78 .08 | 49.04 .65 | 11.15 .32 |
| July 8.3 | 48.31 - .19 | 34.06 + 1.22 | 42.86 - .09 | 8.09 - .13 | 22.73 - 1.35 | 21.69 - .11 | 49.73 + .72 | 10.76 - .47 |
| 18.3 | 48.11 .21 | 35.31 1.27 | 42.76 .11 | 7.95 .15 | 21.27 1.58 | 21.56 .14 | 50.48 .77 | 10.21 .61 |
| 28.3 | 47.90 .22 | 36.59 1.29 | 42.64 .13 | 7.79 .17 | 19.57 1.78 | 21.42 .16 | 51.26 .80 | 9.50 .74 |
| Aug. 7.2 | 47.66 .23 | 37.89 1.29 | 42.50 .15 | 7.61 .19 | 17.75 1.85 | 21.25 .18 | 52.07 .81 | 8.70 .84 |
| 17.2 | 47.43 .22 | 39.17 1.26 | 42.35 .16 | 7.41 .20 | 15.86 1.89 | 21.07 .19 | 52.88 .81 | 7.82 .91 |
| 27.2 | 47.21 - .21 | 40.41 + 1.20 | 42.18 - .17 | 7.22 - .18 | 13.96 - 1.87 | 20.88 - .19 | 53.69 + .80 | 6.89 - .94 |
| | | | | | | | | |
| Mean Solar Date. | ρ Herculis. | σ Cor. Bor. (mean.) | γ Apodis. | η Urs. Min. | η Ophiuchi. | π Herculis. | θ Ophiuchi. | δ Aræ. |
| | $44^{\circ} 47'$ h m 16 5 | $55^{\circ} 52'$ h m 16 10 | $168^{\circ} 39'$ h m 16 16 | $14^{\circ} 0'$ h m 16 20 | $105^{\circ} 35'$ h m 17 4 | $53^{\circ} 4'$ h m 17 11 | $114^{\circ} 53'$ h m 17 15 | $150^{\circ} 36'$ h m 17 21 |
| Apr. 9.6 | 21.33 + .24 | 36.85 + .23 | 48.93 + 1.03 | 46.03 + .63 | 8.14 + .28 | 15.87 + .29 | 19.43 + .31 | 16.66 + .54 |
| 19.6 | 21.56 .21 | 37.07 .20 | 49.90 .91 | 46.60 .50 | 8.41 .26 | 16.15 .27 | 19.73 .28 | 17.18 .50 |
| 29.6 | 21.76 .18 | 37.26 .17 | 50.75 .78 | 47.04 .37 | 8.65 .24 | 16.41 .24 | 19.99 .25 | 17.66 .46 |
| May 9.6 | 21.91 .14 | 37.41 .14 | 51.42 .60 | 47.34 .22 | 8.88 .21 | 16.62 .20 | 20.24 .23 | 18.09 .41 |
| 19.5 | 22.03 .09 | 37.54 .10 | 51.96 .45 | 47.48 + .06 | 9.07 .18 | 16.80 .16 | 20.46 .20 | 18.47 .36 |
| 29.5 | 22.08 + .04 | 37.61 + .08 | 52.32 + .27 | 47.47 - .09 | 9.24 + .15 | 16.95 + .12 | 20.65 + .17 | 18.80 + .29 |
| June 8.5 | 22.10 - .01 | 37.65 + .02 | 52.50 + .09 | 47.31 .24 | 9.38 .12 | 17.04 .08 | 20.81 .14 | 19.04 .22 |
| 18.4 | 22.06 .06 | 37.65 - .02 | 52.50 - .09 | 46.99 .38 | 9.49 .08 | 17.10 + .04 | 20.93 .10 | 19.23 .15 |
| 28.4 | 21.98 .11 | 37.61 .06 | 52.32 .27 | 46.54 .51 | 9.55 + .04 | 17.12 - .01 | 21.00 .06 | 19.34 + .07 |
| July 8.4 | 21.85 .15 | 37.53 .10 | 51.96 .44 | 45.96 .64 | 9.57 .00 | 17.08 .06 | 21.05 + .02 | 19.36 - .01 |
| 18.4 | 21.69 - .18 | 37.42 - .13 | 51.44 - .60 | 45.26 - .74 | 9.56 - .03 | 17.00 - .10 | 21.04 - .03 | 19.32 - .08 |
| 28.3 | 21.49 .21 | 37.27 .16 | 50.76 .73 | 44.48 .82 | 9.51 .07 | 16.88 .14 | 20.99 .07 | 19.20 .16 |
| Aug. 7.3 | 21.27 .23 | 37.10 .19 | 49.98 .84 | 43.63 .88 | 9.42 .10 | 16.72 .17 | 20.91 .10 | 19.00 .22 |
| 17.3 | 21.02 .26 | 36.90 .21 | 49.08 .92 | 42.72 .93 | 9.31 .13 | 16.53 .20 | 20.78 .13 | 18.75 .28 |
| 27.3 | 20.75 .27 | 36.69 .22 | 48.13 .96 | 41.78 .95 | 9.16 .15 | 16.31 .22 | 20.64 .15 | 18.44 .33 |
| Sept. 6.2 | 20.48 - .27 | 36.47 - .22 | 47.16 - .96 | 40.82 - .95 | 9.01 - .16 | 16.08 - .23 | 20.48 - .17 | 18.09 - .35 |
| 16.2 | 20.22 .26 | 36.26 .22 | 46.20 .93 | 39.88 .91 | 8.84 .17 | 15.84 .24 | 20.29 .18 | 17.74 .26 |
| 26.2 | 19.96 .24 | 36.04 .22 | 45.30 .85 | 39.00 .85 | 8.67 .16 | 15.60 .23 | 20.12 .17 | 17.38 .35 |
| Oct. 6.1 | 19.75 - .19 | 35.81 - .22 | 44.50 - .74 | 38.18 - .78 | 8.53 - .14 | 15.37 - .22 | 19.96 - .15 | 17.04 - .33 |

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | Groombr. 944, S. P. | ϵ Herculis. | θ Herculis. | σ Herculis. | λ Sagittarii. | χ Draconis. | ζ Pavonis. | γ Lyrae. |
|------------------------|--|--|--|--|--|--|--|--|
| | 355° 8' | 43° 56' | 52° 44' | 61° 15' | 115° 29' | 17° 19' | 161° 31' | 57° 28' |
| | $\begin{smallmatrix} h & m \\ 17 & 26 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 17 & 36 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 17 & 52 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 18 & 3 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 18 & 21 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 18 & 22 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 18 & 30 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 18 & 54 \end{smallmatrix}$ |
| May 19.6 | 52.78 - .46 | 25.28 + .19 | 32.47 + .19 | 18.89 + .21 | 16.05 + .26 | 64.84 + .43 | 21.56 + .64 | 53.24 + .25 |
| 29.6 | 52.55 .00 | 25.45 .15 | 32.65 .16 | 19.09 .18 | 16.30 .24 | 65.21 .31 | 22.17 .56 | 53.48 .22 |
| June 8.5 | 52.78 + .46 | 25.58 .10 | 32.80 .19 | 19.25 .14 | 16.53 .21 | 65.46 .19 | 22.72 .49 | 53.69 .19 |
| 18.5 | 53.48 .29 | 25.65 + .05 | 32.90 .08 | 19.36 .10 | 16.71 .17 | 65.58 + .06 | 23.14 .37 | 53.86 .15 |
| 28.5 | 54.61 1.34 | 25.67 .00 | 32.95 + .03 | 19.45 .06 | 16.86 .13 | 65.58 - .07 | 23.46 .26 | 53.99 .11 |
| July 8.5 | 56.16 +1.74 | 25.64 - .06 | 32.97 - .02 | 19.48 + .01 | 16.97 + .08 | 65.45 - .19 | 23.65 + .13 | 54.07 + .06 |
| 18.4 | 58.09 2.07 | 25.55 .11 | 32.92 .06 | 19.47 - .03 | 17.02 + .03 | 65.19 .31 | 23.72 .00 | 54.11 + .01 |
| 28.4 | 60.30 2.37 | 25.41 .16 | 32.84 .11 | 19.42 .08 | 17.03 - .02 | 64.83 .42 | 23.66 - .19 | 54.09 - .04 |
| Aug. 7.4 | 62.83 2.63 | 25.23 .20 | 32.71 .15 | 19.32 .12 | 17.00 .06 | 64.34 .52 | 23.49 .23 | 54.04 .08 |
| 17.3 | 65.57 2.82 | 25.01 .24 | 32.54 .19 | 19.18 .15 | 16.92 .10 | 63.78 .62 | 23.20 .24 | 53.93 .13 |
| 27.3 | 68.47 +2.96 | 24.75 - .27 | 32.34 - .21 | 19.02 - .18 | 16.81 - .14 | 63.11 - .70 | 22.80 - .44 | 53.78 - .16 |
| Sept. 6.3 | 71.50 3.06 | 24.48 .29 | 32.12 .23 | 18.83 .20 | 16.65 .16 | 62.39 .75 | 22.33 .51 | 53.61 .19 |
| 16.3 | 74.59 3.08 | 24.18 .30 | 31.87 .25 | 18.62 .21 | 16.49 .18 | 61.62 .78 | 21.78 .56 | 53.40 .21 |
| 26.2 | 77.67 3.05 | 23.88 .29 | 31.62 .25 | 18.41 .22 | 16.30 .18 | 60.83 .80 | 21.21 .58 | 53.18 .22 |
| Oct. 6.2 | 80.69 2.98 | 23.60 .27 | 31.38 .24 | 18.19 .21 | 16.13 .18 | 60.02 .80 | 20.62 .56 | 52.96 .23 |
| 16.2 | 83.63 +2.88 | 23.33 - .25 | 31.14 - .23 | 17.99 - .19 | 15.95 - .17 | 59.23 - .78 | 20.05 - .56 | 52.73 - .22 |
| | | | | | | | | |
| Mean Solar Date. | ϵ Lyrae. | 25 Camelop. S. P. | θ Lyrae. | β Cygni. | β Sagittae. | δ Cygni. | Groombr. 1374, S. P. | ϵ Pavonis. |
| | 54° 4' | 352° 27' | 52° 4' | 62° 16' | 72° 47' | 45° 8' | 344° 12' | 163° 12' |
| | $\begin{smallmatrix} h & m \\ 19 & 3 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 19 & 8 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 19 & 12 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 19 & 26 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 19 & 36 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 19 & 41 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 19 & 47 \end{smallmatrix}$ | $\begin{smallmatrix} h & m \\ 19 & 48 \end{smallmatrix}$ |
| May 29.6 | 26.26 + .24 | 0.85 - .00 | 36.50 + .25 | 20.84 + .24 | 10.42 + .26 | 35.52 + .29 | 5.88 - .35 | 2.47 + .21 |
| June 8.6 | 26.48 .20 | 0.37 .26 | 36.73 .21 | 21.07 .22 | 10.67 .23 | 35.79 .25 | 5.59 .23 | 3.23 .71 |
| 18.6 | 26.66 .16 | 0.17 - .06 | 36.92 .17 | 21.28 .19 | 10.88 .20 | 36.02 .20 | 5.42 - .11 | 3.89 .61 |
| 28.5 | 26.80 .11 | 0.26 + .23 | 37.06 .12 | 21.45 .14 | 11.06 .16 | 36.20 .15 | 5.37 + .02 | 4.45 .50 |
| July 8.5 | 26.89 .06 | 0.63 .22 | 37.16 .07 | 21.56 .09 | 11.20 .12 | 36.32 .10 | 5.47 .16 | 4.69 .38 |
| 18.5 | 26.92 + .01 | 1.29 + .20 | 37.20 + .02 | 21.64 + .05 | 11.29 + .07 | 36.40 + .04 | 5.69 + .26 | 5.21 + .25 |
| 28.4 | 26.91 - .03 | 2.22 1.04 | 37.20 - .03 | 21.66 + .01 | 11.34 + .03 | 36.40 - .02 | 6.03 .41 | 5.38 + .10 |
| Aug. 7.4 | 26.86 .08 | 3.37 1.26 | 37.14 .08 | 21.65 - .04 | 11.35 - .01 | 36.36 .07 | 6.51 .52 | 5.41 - .04 |
| 17.4 | 26.75 .13 | 4.74 1.47 | 37.03 .13 | 21.58 .09 | 11.31 .06 | 36.26 .12 | 7.07 .62 | 5.29 .18 |
| 27.4 | 26.60 .17 | 6.31 1.67 | 36.89 .17 | 21.47 .13 | 11.23 .10 | 36.12 .17 | 7.75 .72 | 5.05 .20 |
| Sept. 6.3 | 26.41 - .20 | 8.08 +1.83 | 36.70 - .20 | 21.32 - .16 | 11.12 - .13 | 35.92 - .21 | 8.52 + .21 | 4.69 - .42 |
| 16.3 | 26.20 .22 | 9.96 1.94 | 36.48 .22 | 21.16 .18 | 10.97 .15 | 35.69 .24 | 9.36 .88 | 4.21 .52 |
| 26.3 | 25.97 .23 | 11.95 2.03 | 36.24 .24 | 20.96 .20 | 10.81 .17 | 35.45 .26 | 10.27 .94 | 3.65 .50 |
| Oct. 6.3 | 25.73 .24 | 14.01 2.08 | 35.99 .25 | 20.75 .21 | 10.63 .18 | 35.17 .28 | 11.24 .98 | 3.03 .63 |
| 16.2 | 25.49 .24 | 16.11 2.08 | 35.75 .24 | 20.55 .20 | 10.45 .18 | 34.89 .28 | 12.24 1.00 | 2.39 .63 |
| 26.2 | 25.25 - .22 | 18.16 +2.04 | 35.51 - .23 | 20.35 - .19 | 10.27 - .17 | 34.61 - .28 | 13.24 +1.01 | 1.76 - .02 |
| Nov. 5.2 | 25.05 - .19 | 20.20 +2.00 | 35.29 - .21 | 20.16 - .18 | 10.11 - .15 | 34.33 - .27 | 14.26 +1.01 | 1.15 - .50 |

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | γ Sagittæ. | ϵ Sagittarii. | θ Aquilæ. | 31 Cygni. | α Delphini. | β Pavonis. | ψ Capricor. | ϵ Cygni. |
|------------------------|---|---|---|---|---|---|---|---|
| | 70° 48' | 118° 1' | 91° 9' | 43° 35' | 74° 28' | 156° 36' | 115° 40' | 56° 26' |
| | ^h ₁₉ ^m ₅₃ | ^h ₁₉ ^m ₅₅ | ^h ₂₀ ^m ₅ | ^h ₂₀ ^m ₁₀ | ^h ₂₀ ^m ₃₄ | ^h ₂₀ ^m ₃₅ | ^h ₂₀ ^m ₃₉ | ^h ₂₀ ^m ₄₁ |
| June 18.6 | 56.21 + .20 | 59.32 + .26 | 42.45 + .21 | 13.77 + .23 | 35.98 + .23 | 11.71 + .54 | 40.25 + .28 | 49.56 + .26 |
| 28.6 | 56.40 .17 | 59.57 .22 | 42.65 .19 | 13.98 .19 | 36.20 .21 | 12.22 .47 | 40.52 .25 | 49.80 .22 |
| July 8.5 | 56.56 .13 | 59.76 .18 | 42.84 .16 | 14.15 .14 | 36.40 .18 | 12.66 .40 | 40.75 .21 | 50.00 .17 |
| 18.5 | 56.67 .09 | 59.92 .14 | 42.97 .11 | 14.26 .08 | 36.55 .13 | 13.01 .30 | 40.95 .17 | 50.15 .12 |
| 28.5 | 56.73 + .05 | 60.03 .09 | 43.06 .07 | 14.30 + .02 | 36.65 .08 | 13.27 .20 | 41.10 .12 | 50.25 .07 |
| Aug. 7.5 | 56.76 .00 | 60.08 + .03 | 43.11 + .02 | 14.30 - .04 | 36.72 + .04 | 13.41 + .09 | 41.19 + .07 | 50.30 + .03 |
| 17.4 | 56.73 - .05 | 60.08 - .02 | 43.11 - .02 | 14.23 .10 | 36.74 .00 | 13.45 - .01 | 41.24 + .02 | 50.31 - .02 |
| 27.4 | 56.66 .09 | 60.04 .06 | 43.08 .06 | 14.11 .15 | 36.72 - .04 | 13.39 .11 | 41.24 - .02 | 50.27 .07 |
| Sept. 6.4 | 56.55 .12 | 59.95 .10 | 43.00 .09 | 13.94 .19 | 36.65 .08 | 13.23 .21 | 41.20 .06 | 50.18 .11 |
| 16.4 | 56.42 .15 | 59.83 .13 | 42.90 .12 | 13.73 .23 | 36.55 .12 | 12.97 .29 | 41.11 .10 | 50.05 .15 |
| 26.3 | 56.26 - .17 | 59.68 - .16 | 42.76 - .14 | 13.48 - .26 | 36.42 - .14 | 12.65 - .35 | 40.99 - .13 | 49.88 - .17 |
| Oct. 6.3 | 56.08 .18 | 59.51 .18 | 42.62 .15 | 13.21 .27 | 36.27 .15 | 12.26 .41 | 40.85 .15 | 49.70 .19 |
| 16.3 | 55.91 .18 | 59.33 .18 | 42.46 .16 | 12.93 .28 | 36.11 .16 | 11.83 .43 | 40.69 .16 | 49.50 .20 |
| 26.2 | 55.72 .18 | 59.16 .17 | 42.30 .16 | 12.65 .28 | 35.94 .16 | 11.39 .44 | 40.53 .16 | 49.30 .21 |
| Nov. 5.2 | 55.55 .16 | 59.00 .15 | 42.15 .14 | 12.37 .27 | 35.78 .15 | 10.95 .43 | 40.37 .15 | 49.09 .20 |
| 15.2 | 55.41 - .13 | 58.86 - .12 | 42.03 - .11 | 12.11 - .25 | 35.64 - .14 | 10.53 - .40 | 40.22 - .14 | 48.90 - .18 |
| 25.2 | 55.30 - .10 | 58.75 - .09 | 41.94 - .08 | 11.87 - .23 | 35.50 - .13 | 10.16 - .35 | 40.09 - .12 | 48.72 - .16 |
| | | | | | | | | |
| Mean Solar Date. | τ Cygni. | ζ Capricor. | 74 Cygni. | λ Octantis. | ζ Chamæle- ontis, S.P. | π^2 Cygni. | 16 Pegasi. | π Pegasi. |
| | 52° 25' | 112° 53' | 50° 5' | 173° 13' | 189° 33' | 41° 12' | 64° 35' | 57° 21' |
| | ^h ₂₁ ^m ₁₀ | ^h ₂₁ ^m ₂₀ | ^h ₂₁ ^m ₃₂ | ^h ₂₁ ^m ₃₄ | ^h ₂₁ ^m ₃₆ | ^h ₂₁ ^m ₄₂ | ^h ₂₁ ^m ₄₈ | ^h ₂₂ ^m ₅ |
| July 8.6 | 28.27 + .21 | 28.73 + .25 | 36.58 + .23 | 21.01 + 1.44 | 56.87 - .84 | 47.82 + .26 | 7.79 + .24 | 10.39 + .26 |
| 18.6 | 28.46 .16 | 28.96 .21 | 36.79 .19 | 22.33 1.19 | 56.11 .68 | 48.06 .21 | 8.01 .20 | 10.63 .22 |
| 28.5 | 28.59 .11 | 29.15 .16 | 36.95 .14 | 23.38 .89 | 55.51 .49 | 48.24 .16 | 8.18 .15 | 10.82 .17 |
| Aug. 7.5 | 28.68 .06 | 29.28 .11 | 37.07 .09 | 24.11 .57 | 55.14 .27 | 48.37 .10 | 8.31 .11 | 10.97 .12 |
| 17.5 | 28.71 + .01 | 29.37 .06 | 37.12 + .03 | 24.51 + .24 | 54.97 - .07 | 48.43 + .03 | 8.41 .07 | 11.07 .08 |
| 27.5 | 28.69 - .04 | 29.41 + .01 | 37.13 - .02 | 24.59 - .09 | 55.01 + .18 | 48.43 - .03 | 8.45 + .02 | 11.13 + .03 |
| Sept. 6.4 | 28.62 .09 | 29.40 - .03 | 37.09 .07 | 24.33 .44 | 55.32 .44 | 48.38 .08 | 8.44 - .03 | 11.13 - .01 |
| 16.4 | 28.51 .13 | 29.36 .07 | 37.00 .11 | 23.71 .76 | 55.86 .64 | 48.28 .13 | 8.39 .06 | 11.11 .05 |
| 26.4 | 28.37 .16 | 29.27 .10 | 36.87 .15 | 22.81 1.04 | 56.58 .82 | 48.12 .18 | 8.32 .09 | 11.03 .09 |
| Oct. 6.4 | 28.19 .19 | 29.15 .12 | 36.70 .18 | 21.64 1.26 | 57.51 1.09 | 47.92 .21 | 8.20 .12 | 10.92 .12 |
| 16.3 | 27.99 - .20 | 29.02 - .14 | 36.51 - .20 | 20.25 - 1.47 | 58.62 + 1.17 | 47.70 - .23 | 8.07 - .14 | 10.78 - .15 |
| 26.3 | 27.78 .21 | 28.87 .15 | 36.30 .21 | 18.71 1.60 | 59.85 1.27 | 47.46 .25 | 7.92 .15 | 10.62 .17 |
| Nov. 5.3 | 27.57 .21 | 28.72 .15 | 36.09 .21 | 17.06 1.66 | 61.16 1.33 | 47.20 .26 | 7.76 .16 | 10.45 .18 |
| 15.2 | 27.36 .20 | 28.58 .14 | 35.87 .21 | 15.40 1.64 | 62.51 1.35 | 46.93 .26 | 7.59 .15 | 10.27 .17 |
| 25.2 | 27.16 .19 | 28.44 .12 | 35.67 .20 | 13.77 1.58 | 63.86 1.31 | 46.67 .25 | 7.45 .14 | 10.10 .16 |
| Dec. 5.2 | 26.99 - .16 | 28.33 - .10 | 35.47 - .19 | 12.25 - 1.45 | 65.13 + 1.20 | 46.42 - .24 | 7.31 - .13 | 9.94 - .15 |

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS,
FOR THE UPPER TRANSIT AT WASHINGTON.

| Mean Solar Date. | ν Octantis. | γ Aquarii. | σ Aquarii. | α Lacertæ. | 10 Lacertæ. | β Octantis. | λ Pegasi. | Groombr. 1706, S. P. |
|------------------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 176° 31' h m 22 10 | 91° 56' h m 22 16 | 101° 14' h m 22 24 | 40° 17' h m 22 26 | 51° 31' h m 22 34 | 171° 57' h m 22 34 | 67° 0' h m 22 41 | 348° 21' h m 22 51 |
| July 8.6 | 59.91 +3.06 | 3.19 + .25 | 54.33 + .27 | 49.64 + .32 | 23.69 + .29 | 61.88 +1.43 | 18.25 + .27 | 12.00 - .62 |
| 18.6 | 62.76 .26 | 3.43 .23 | 54.59 .24 | 49.94 .27 | 23.96 .25 | 63.24 1.29 | 18.51 .24 | 11.44 .50 |
| 28.6 | 65.13 2.10 | 3.64 .19 | 54.81 .20 | 50.19 .22 | 24.19 .21 | 64.45 1.10 | 18.74 .21 | 11.01 .37 |
| Aug. 7.6 | 66.95 1.53 | 3.80 .15 | 55.00 .16 | 50.38 .16 | 24.38 .17 | 65.43 .85 | 18.92 .17 | 10.71 .24 |
| 17.5 | 68.19 .22 | 3.94 .11 | 55.14 .12 | 50.50 .10 | 24.52 .12 | 66.14 .58 | 19.07 .13 | 10.53 - .10 |
| 27.5 | 68.79 + .27 | 4.02 + .06 | 55.23 + .08 | 50.57 + .04 | 24.61 + .06 | 66.59 + .31 | 19.17 + .08 | 10.51 + .05 |
| Sept. 6.5 | 68.73 - .40 | 4.06 + .02 | 55.29 + .04 | 50.59 - .01 | 24.64 + .01 | 66.76 + .02 | 19.23 + .03 | 10.63 .21 |
| 16.4 | 67.99 1.04 | 4.06 - .02 | 55.30 .00 | 50.55 .06 | 24.63 - .03 | 66.63 - .27 | 19.24 - .01 | 10.93 .37 |
| 26.4 | 66.66 1.63 | 4.03 .05 | 55.28 - .04 | 50.46 .11 | 24.59 .07 | 66.22 .55 | 19.21 .04 | 11.38 .52 |
| Oct. 6.4 | 64.72 2.20 | 3.96 .08 | 55.22 .07 | 50.33 .15 | 24.50 .11 | 65.54 .79 | 19.16 .07 | 11.98 .67 |
| 16.4 | 62.27 -2.65 | 3.88 - .10 | 55.14 - .09 | 50.15 - .19 | 24.37 - .14 | 64.64 -1.00 | 19.07 - .10 | 12.72 + .28 |
| 26.3 | 59.43 3.00 | 3.77 .12 | 55.03 .11 | 49.95 .22 | 24.23 .16 | 63.54 1.18 | 18.96 .12 | 13.62 .25 |
| Nov. 5.3 | 56.26 3.25 | 3.65 .13 | 54.92 .12 | 49.72 .24 | 24.06 .18 | 62.28 1.31 | 18.83 .13 | 14.62 1.06 |
| 15.3 | 52.94 3.34 | 3.52 .12 | 54.79 .13 | 49.47 .25 | 23.87 .19 | 60.92 1.38 | 18.71 .14 | 15.73 1.17 |
| 25.3 | 49.58 3.32 | 3.41 .11 | 54.67 .12 | 49.21 .25 | 23.69 .19 | 59.52 1.39 | 18.56 .14 | 16.95 1.24 |
| Dec. 5.2 | 46.30 -3.18 | 3.29 - .10 | 54.56 - .11 | 48.96 - .24 | 23.50 - .19 | 58.14 -1.36 | 18.42 - .13 | 18.20 +1.27 |
| 15.2 | 43.27 -2.90 | 3.20 - .08 | 54.45 - .10 | 48.72 - .23 | 23.31 - .18 | 56.81 -1.28 | 18.30 - .11 | 19.48 +1.28 |
| | | | | | | | | |
| Mean Solar Date. | σ Androm. | ϕ Aquarii. | τ Pegasi. | λ Androm. | δ Aquarii. | δ Sculptoris. | γ Octantis. | 33 Piscium. |
| | 48° 16' h m 22 56 | 96° 38' h m 23 8 | 66° 51' h m 23 15 | 44° 8' h m 23 32 | 108° 53' h m 23 38 | 118° 44' h m 23 43 | 172° 37' h m 23 45 | 96° 19' h m 23 59 |
| July 28.6 | 56.27 + .22 | 42.59 + .24 | 16.29 + .22 | 15.61 + .29 | 34.82 + .27 | 16.92 + .26 | 50.52 +1.48 | 47.06 + .25 |
| Aug. 7.6 | 56.49 .20 | 42.81 .20 | 16.50 .19 | 15.88 .24 | 35.07 .23 | 17.17 .24 | 51.91 1.29 | 47.30 .23 |
| 17.6 | 56.66 .15 | 42.98 .16 | 16.68 .16 | 16.10 .19 | 35.28 .19 | 17.41 .21 | 53.10 1.06 | 47.52 .20 |
| 27.5 | 56.78 .10 | 43.12 .12 | 16.82 .12 | 16.27 .14 | 35.45 .15 | 17.60 .17 | 54.03 .79 | 47.70 .16 |
| Sept. 6.5 | 56.85 + .04 | 43.21 .08 | 16.91 .07 | 16.39 .09 | 35.58 .11 | 17.75 .13 | 54.67 .50 | 47.85 .13 |
| 16.5 | 56.86 - .01 | 43.27 + .04 | 16.96 + .03 | 16.46 + .04 | 35.68 + .07 | 17.85 + .08 | 55.02 + .20 | 47.96 + .09 |
| 26.5 | 56.84 .05 | 43.28 .00 | 16.98 .00 | 16.48 .00 | 35.72 + .03 | 17.89 + .03 | 55.07 - .12 | 48.03 .05 |
| Oct. 6.4 | 56.77 .09 | 43.27 - .03 | 16.96 - .04 | 16.46 - .04 | 35.73 - .01 | 17.91 - .01 | 54.78 .43 | 48.06 + .01 |
| 16.4 | 56.66 .12 | 43.22 .06 | 16.91 .07 | 16.39 .08 | 35.70 .04 | 17.88 .05 | 54.22 .71 | 48.05 - .02 |
| 26.4 | 56.53 .15 | 43.15 .08 | 16.82 .10 | 16.29 .12 | 35.65 .07 | 17.82 .08 | 53.35 .99 | 48.03 .04 |
| Nov. 5.3 | 56.37 - .17 | 43.05 - .10 | 16.72 - .11 | 16.15 - .15 | 35.57 - .09 | 17.73 - .10 | 52.25 -1.20 | 47.98 - .06 |
| 15.3 | 56.19 .19 | 42.95 .11 | 16.61 .12 | 15.99 .17 | 35.47 .10 | 17.63 .12 | 50.94 1.37 | 47.90 .08 |
| 25.3 | 56.00 .20 | 42.81 .11 | 16.48 .13 | 15.80 .19 | 35.36 .11 | 17.50 .13 | 49.51 1.49 | 47.82 .09 |
| Dec. 5.3 | 55.80 .20 | 42.73 .11 | 16.35 .13 | 15.60 .20 | 35.25 .12 | 17.37 .13 | 47.97 1.56 | 47.72 .10 |
| 15.2 | 55.61 .19 | 42.63 .10 | 16.23 .13 | 15.40 .20 | 35.13 .11 | 17.24 .13 | 46.39 1.57 | 47.62 .10 |
| 25.2 | 55.43 - .18 | 42.53 - .09 | 16.10 - .12 | 15.20 - .20 | 35.02 - .10 | 17.11 - .13 | 44.83 -1.22 | 47.52 - .10 |
| 35.2 | 55.25 - .17 | 42.46 - .07 | 15.98 - .11 | 14.99 - .20 | 34.92 - .09 | 16.99 - .12 | 43.36 -1.40 | 47.41 - .10 |

FOR WASHINGTON MEAN AND APPARENT NOON.

| Date. | Apparent Right Ascension. | | Apparent Declination. | | Hourly Motion. | | Equation of Time for Apparent Noon. | Semi-diameter at Apparent Noon. | Sidereal Time of Semid. Passing Merid. | Sidereal Time of Mean Noon. |
|-------|---------------------------|------------|-----------------------|------------|----------------|--------------|-------------------------------------|---------------------------------|--|-----------------------------|
| | Mean Noon. | App. Noon. | Mean Noon. | App. Noon. | Right Ascen. | Declination. | | | | |
| Jan. | h m s | s | ° ' " | " | " | " | m s | " | m s | h m s |
| | 18 48 5.38 | 6.09 | -22 59 36.5 | 35.7 | 11.034 | +12.67 | + 3 50.91 | 16 18.41 | 1 11.08 | 18 44 14.55 |
| | 2 18 52 30.05 | 30.85 | 22 54 18.6 | 17.6 | 11.031 | 13.81 | 4 19.03 | 16 18.41 | 1 11.03 | 18 48 11.11 |
| | 3 18 56 54.40 | 55.28 | 22 48 33.3 | 32.1 | 11.007 | 14.95 | 4 46.82 | 16 18.40 | 1 10.98 | 18 52 7.67 |
| | 4 19 1 18.38 | 19.34 | 22 42 20.7 | 19.3 | 10.980 | 16.08 | 5 14.24 | 16 18.38 | 1 10.93 | 18 56 4.23 |
| | 5 19 5 41.95 | 42.99 | 22 35 41.2 | 39.6 | 10.973 | 17.90 | 5 41.25 | 16 18.35 | 1 10.87 | 19 0 0.79 |
| | 6 19 10 5.07 | 6.19 | -22 28 34.9 | 33.0 | 10.955 | +18.32 | + 6 7.83 | 16 18.32 | 1 10.81 | 19 3 57.35 |
| | 7 19 14 27.74 | 28.93 | 22 20 61.9 | 59.8 | 10.936 | 19.42 | 6 33.95 | 16 18.29 | 1 10.74 | 19 7 53.90 |
| | 8 19 18 49.92 | 51.18 | 22 13 2.5 | 0.1 | 10.914 | 20.52 | 6 59.58 | 16 18.26 | 1 10.67 | 19 11 50.46 |
| | 9 19 23 11.58 | 12.91 | 22 4 37.0 | 34.3 | 10.892 | 21.60 | 7 24.68 | 16 18.22 | 1 10.59 | 19 15 47.02 |
| | 10 19 27 32.69 | 34.09 | 21 55 45.6 | 42.6 | 10.868 | 22.68 | 7 49.24 | 16 18.18 | 1 10.51 | 19 19 43.58 |
| | 11 19 31 53.22 | 54.69 | -21 46 28.4 | 25.1 | 10.842 | +23.74 | + 8 13.21 | 16 18.14 | 1 10.43 | 19 23 40.13 |
| | 12 19 36 13.14 | 14.68 | 21 36 45.8 | 42.2 | 10.816 | 24.79 | 8 36.58 | 16 18.09 | 1 10.35 | 19 27 36.69 |
| | 13 19 40 32.42 | 34.03 | 21 26 38.1 | 34.2 | 10.790 | 25.82 | 8 59.31 | 16 18.04 | 1 10.26 | 19 31 33.25 |
| | 14 19 44 51.05 | 52.72 | 21 16 5.7 | 1.5 | 10.762 | 26.85 | 9 21.38 | 16 17.98 | 1 10.17 | 19 35 29.81 |
| | 15 19 49 9.00 | 10.73 | 21 5 8.8 | 4.3 | 10.733 | 27.86 | 9 42.78 | 16 17.92 | 1 10.08 | 19 39 26.36 |
| | 16 19 53 26.25 | 28.03 | -20 53 47.6 | 42.7 | 10.702 | +28.87 | +10 3.47 | 16 17.85 | 1 9.99 | 19 43 22.92 |
| | 17 19 57 42.77 | 44.61 | 20 41 62.5 | 57.3 | 10.671 | 29.86 | 10 23.44 | 16 17.77 | 1 9.89 | 19 47 19.47 |
| | 18 20 1 58.56 | 60.45 | 20 29 54.0 | 48.5 | 10.640 | 30.84 | 10 42.67 | 16 17.69 | 1 9.79 | 19 51 16.03 |
| | 19 20 6 13.61 | 15.55 | 20 17 22.3 | 16.5 | 10.609 | 31.79 | 11 1.16 | 16 17.61 | 1 9.69 | 19 55 12.59 |
| | 20 20 10 27.90 | 29.88 | 20 4 27.8 | 21.6 | 10.577 | 32.74 | 11 18.89 | 16 17.53 | 1 9.59 | 19 59 9.15 |
| | 21 20 14 41.41 | 43.44 | -19 51 10.8 | 4.3 | 10.545 | +33.67 | +11 35.84 | 16 17.44 | 1 9.49 | 20 3 5.71 |
| | 22 20 18 54.14 | 56.21 | 19 37 31.7 | 24.9 | 10.513 | 34.58 | 11 52.01 | 16 17.34 | 1 9.38 | 20 7 2.27 |
| | 23 20 23 6.08 | 8.19 | 19 23 30.9 | 23.7 | 10.481 | 35.48 | 12 7.38 | 16 17.24 | 1 9.27 | 20 10 58.83 |
| | 24 20 27 17.92 | 10.37 | 19 9 8.6 | 1.1 | 10.448 | 36.36 | 12 21.96 | 16 17.13 | 1 9.16 | 20 14 55.38 |
| | 25 20 31 27.57 | 29.75 | 18 54 25.3 | 17.5 | 10.415 | 37.23 | 12 35.75 | 16 17.01 | 1 9.05 | 20 18 51.94 |
| | 26 20 35 37.12 | 39.33 | -18 39 21.3 | 13.2 | 10.382 | +38.09 | +12 48.74 | 16 16.89 | 1 8.94 | 20 22 48.50 |
| | 27 20 39 45.87 | 48.11 | 18 23 57.1 | 48.7 | 10.349 | 38.92 | 13 0.93 | 16 16.76 | 1 8.83 | 20 26 45.06 |
| | 28 20 43 53.83 | 56.09 | 18 8 13.0 | 4.2 | 10.315 | 39.74 | 13 12.32 | 16 16.63 | 1 8.71 | 20 30 41.61 |
| | 29 20 48 0.98 | 3.26 | 17 52 9.4 | 0.3 | 10.282 | 40.55 | 13 22.91 | 16 16.49 | 1 8.60 | 20 34 38.16 |
| | 30 20 52 7.32 | 9.62 | 17 35 46.5 | 37.1 | 10.248 | 41.34 | 13 32.69 | 16 16.35 | 1 8.48 | 20 38 34.72 |
| Feb. | 31 20 56 12.86 | 15.18 | -17 18 64.8 | 55.2 | 10.215 | +42.11 | +13 41.67 | 16 16.20 | 1 8.37 | 20 42 31.27 |
| | 1 21 0 17.60 | 10.94 | 17 1 64.8 | 55.0 | 10.181 | 42.88 | 13 49.85 | 16 16.05 | 1 8.25 | 20 46 27.82 |
| | 2 21 4 21.54 | 23.89 | 16 44 46.9 | 36.8 | 10.146 | 43.62 | 13 57.23 | 16 15.89 | 1 8.14 | 20 50 24.38 |
| | 3 21 8 24.68 | 27.04 | 16 27 11.3 | 0.9 | 10.114 | 44.34 | 14 3.80 | 16 15.73 | 1 8.02 | 20 54 20.94 |
| | 4 21 12 27.02 | 29.39 | 16 9 18.4 | 7.8 | 10.081 | 45.05 | 14 9.57 | 16 15.56 | 1 7.91 | 20 58 17.50 |
| | 5 21 16 28.56 | 30.94 | -15 50 68.8 | 59.0 | 10.048 | +45.74 | +14 14.54 | 16 15.39 | 1 7.79 | 21 2 14.06 |
| | 6 21 20 29.30 | 31.68 | 15 32 42.9 | 31.9 | 10.014 | 46.41 | 14 18.71 | 16 15.22 | 1 7.68 | 21 6 10.62 |
| | 7 21 24 29.24 | 31.62 | 15 13 61.0 | 49.8 | 9.981 | 47.07 | 14 22.09 | 16 15.04 | 1 7.56 | 21 10 7.17 |
| | 8 21 28 28.39 | 30.77 | 14 54 63.6 | 52.2 | 9.948 | 47.70 | 14 24.68 | 16 14.87 | 1 7.45 | 21 14 3.72 |
| | 9 21 32 26.75 | 29.13 | 14 35 51.1 | 39.5 | 9.915 | 48.32 | 14 26.48 | 16 14.69 | 1 7.34 | 21 18 0.28 |
| | 10 21 36 24.32 | 26.70 | -14 16 24.0 | 12.2 | 9.882 | +48.92 | +14 27.49 | 16 14.51 | 1 7.23 | 21 21 56.83 |
| | 11 21 40 21.10 | 23.47 | 13 56 42.6 | 30.7 | 9.850 | 49.51 | 14 27.71 | 16 14.33 | 1 7.12 | 21 25 53.39 |
| | 12 21 44 17.10 | 19.46 | 13 36 47.5 | 35.4 | 9.817 | 50.07 | 14 27.15 | 16 14.15 | 1 7.01 | 21 29 49.95 |
| | 13 21 48 12.32 | 14.67 | 13 16 39.1 | 26.9 | 9.785 | 50.61 | 14 25.81 | 16 13.96 | 1 6.90 | 21 33 46.50 |
| | 14 21 52 6.78 | 9.12 | 12 56 17.8 | 5.5 | 9.753 | 51.14 | 14 23.71 | 16 13.77 | 1 6.79 | 21 37 43.05 |
| | 15 21 56 0.49 | 2.82 | -12 35 44.0 | 31.6 | 9.721 | +51.66 | +14 20.86 | 16 13.57 | 1 6.69 | 21 41 39.60 |
| | 16 21 59 53.46 | 55.77 | -12 14 58.1 | 45.6 | 9.691 | +52.15 | +14 17.26 | 16 13.37 | 1 6.58 | 21 45 36.16 |

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

| Date. | Apparent Right Ascension. | | Apparent Declination. | | Hourly Motion. | | Equation of Time for Apparent Noon. | Semi-diameter at Apparent Noon. | Sidereal Time of Semid. Passing Merid. | Sidereal Time of Mean Noon. |
|---------|---------------------------|------------|-----------------------|------------|----------------|--------------|-------------------------------------|---------------------------------|--|-----------------------------|
| | Mean Noon. | App. Noon. | Mean Noon. | App. Noon. | Right Ascen. | Declination. | | | | |
| | h m s | s | ° ' " | " | s | " | m s | ' " | m s | h m s |
| Feb. 16 | 21 59 53.46 | 55.77 | -12 14 58.1 | 45.6 | 9.601 | +52.15 | +14 17.26 | 16 13.37 | 1 6.58 | 21 45 36.16 |
| 17 | 22 3 45.69 | 47.98 | 11 53 60.6 | 48.1 | 9.661 | 52.63 | 14 12.93 | 16 13.17 | 1 6.48 | 21 49 32.71 |
| 18 | 22 7 37.21 | 39.48 | 11 32 52.0 | 39.5 | 9.632 | 53.08 | 14 7.89 | 16 12.97 | 1 6.38 | 21 53 29.24 |
| 19 | 22 11 28.03 | 30.28 | 11 11 32.6 | 20.1 | 9.603 | 53.52 | 14 2.15 | 16 12.76 | 1 6.28 | 21 57 25.82 |
| 20 | 22 15 18.17 | 20.30 | 10 49 62.8 | 50.3 | 9.575 | 53.95 | 13 55.73 | 16 12.54 | 1 6.18 | 22 1 22.38 |
| 21 | 22 19 7.63 | 9.83 | -10 28 23.0 | 10.5 | 9.548 | +54.35 | +13 48.64 | 16 12.32 | 1 6.00 | 22 5 18.93 |
| 22 | 22 22 56.45 | 58.62 | 10 6 33.7 | 21.2 | 9.521 | 54.74 | 13 40.90 | 16 12.10 | 1 6.00 | 22 9 15.48 |
| 23 | 22 26 44.64 | 46.78 | 9 44 35.2 | 22.8 | 9.496 | 55.12 | 13 32.53 | 16 11.87 | 1 5.91 | 22 13 12.04 |
| 24 | 22 30 32.22 | 34.33 | 9 22 27.9 | 15.5 | 9.471 | 55.48 | 13 23.55 | 16 11.64 | 1 5.82 | 22 17 8.59 |
| 25 | 22 34 19.22 | 21.30 | 8 59 72.2 | 59.9 | 9.446 | 55.83 | 13 13.99 | 16 11.41 | 1 5.74 | 22 21 5.15 |
| 26 | 22 38 5.65 | 7.70 | - 8 37 48.4 | 36.2 | 9.423 | +56.15 | +13 3.86 | 16 11.17 | 1 5.66 | 22 25 1.70 |
| 27 | 22 41 51.53 | 55.55 | 8 15 16.9 | 4.8 | 9.401 | 56.47 | 12 53.19 | 16 10.93 | 1 5.58 | 22 28 58.25 |
| 28 | 22 45 36.88 | 38.87 | 7 52 38.2 | 26.2 | 9.380 | 56.76 | 12 41.99 | 16 10.68 | 1 5.50 | 22 32 54.80 |
| Mar. 1 | 22 49 21.73 | 23.68 | 7 29 52.6 | 40.7 | 9.359 | 57.04 | 12 30.28 | 16 10.43 | 1 5.43 | 22 36 51.36 |
| 2 | 22 53 6.09 | 8.01 | 7 6 60.4 | 48.6 | 9.339 | 57.30 | 12 18.08 | 16 10.18 | 1 5.36 | 22 40 47.91 |
| 3 | 22 56 49.98 | 51.86 | - 6 43 62.1 | 50.5 | 9.319 | +57.55 | +12 5.41 | 16 9.93 | 1 5.29 | 22 44 44.47 |
| 4 | 23 0 33.42 | 35.26 | 6 20 58.1 | 46.6 | 9.301 | 57.78 | 11 52.29 | 16 9.68 | 1 5.22 | 22 48 41.02 |
| 5 | 23 4 16.43 | 18.23 | 5 57 48.7 | 37.4 | 9.283 | 57.99 | 11 38.74 | 16 9.42 | 1 5.15 | 22 52 37.57 |
| 6 | 23 7 59.02 | 60.78 | 5 34 34.3 | 23.2 | 9.267 | 58.19 | 11 24.78 | 16 9.16 | 1 5.09 | 22 56 34.12 |
| 7 | 23 11 41.21 | 42.93 | 5 11 15.3 | 4.4 | 9.251 | 58.38 | 11 10.42 | 16 8.90 | 1 5.03 | 23 0 30.68 |
| 8 | 23 15 23.02 | 24.70 | - 4 47 52.1 | 41.4 | 9.235 | +58.54 | +10 55.68 | 16 8.63 | 1 4.97 | 23 4 27.23 |
| 9 | 23 19 4.47 | 6.10 | 4 24 25.1 | 14.6 | 9.220 | 58.70 | 10 40.57 | 16 8.37 | 1 4.92 | 23 8 23.79 |
| 10 | 23 22 45.57 | 47.16 | 4 0 54.7 | 44.4 | 9.206 | 58.83 | 10 25.11 | 16 8.11 | 1 4.87 | 23 12 20.34 |
| 11 | 23 26 26.33 | 27.88 | 3 37 21.4 | 11.3 | 9.192 | 58.94 | 10 9.32 | 16 7.85 | 1 4.82 | 23 16 16.90 |
| 12 | 23 30 6.77 | 8.28 | 3 13 45.5 | 35.7 | 9.179 | 59.04 | 9 53.21 | 16 7.59 | 1 4.77 | 23 20 13.45 |
| 13 | 23 33 46.91 | 48.38 | - 2 49 67.4 | 57.9 | 9.166 | +59.13 | + 9 36.80 | 16 7.33 | 1 4.73 | 23 24 10.00 |
| 14 | 23 37 26.77 | 28.20 | 2 26 27.5 | 18.3 | 9.155 | 59.19 | 9 30.11 | 16 7.07 | 1 4.69 | 23 28 6.55 |
| 15 | 23 41 6.37 | 7.75 | 2 2 46.3 | 37.4 | 9.144 | 59.23 | 9 3.15 | 16 6.80 | 1 4.65 | 23 32 3.11 |
| 16 | 23 44 45.71 | 47.05 | 1 38 64.1 | 55.5 | 9.134 | 59.25 | 8 45.94 | 16 6.54 | 1 4.62 | 23 35 59.66 |
| 17 | 23 48 24.83 | 26.12 | 1 15 21.3 | 13.0 | 9.125 | 59.27 | 8 28.52 | 16 6.27 | 1 4.59 | 23 39 56.21 |
| 18 | 23 52 3.75 | 4.99 | - 0 51 38.3 | 30.3 | 9.118 | +59.28 | + 8 10.89 | 16 6.01 | 1 4.57 | 23 43 52.76 |
| 19 | 23 55 42.47 | 43.67 | 0 27 55.4 | 47.6 | 9.111 | 59.28 | 7 53.06 | 16 5.74 | 1 4.55 | 23 47 49.32 |
| 20 | 23 59 21.03 | 22.19 | - 0 4 13.0 | 5.5 | 9.105 | 59.25 | 7 35.06 | 16 5.47 | 1 4.53 | 23 51 45.87 |
| 21 | 0 2 59.45 | 60.57 | + 0 19 28.6 | 35.8 | 9.099 | 59.21 | 7 16.94 | 16 5.20 | 1 4.51 | 23 55 42.42 |
| 22 | 0 6 37.76 | 38.83 | 0 43 8.9 | 15.8 | 9.095 | 59.16 | 6 58.70 | 16 4.93 | 1 4.49 | 23 59 38.97 |
| 23 | 0 10 15.97 | 16.99 | + 1 6 47.6 | 54.2 | 9.091 | +59.08 | + 6 40.36 | 16 4.66 | 1 4.48 | 0 3 35.53 |
| 24 | 0 13 54.10 | 55.07 | 1 30 24.4 | 30.7 | 9.089 | 59.00 | 6 21.95 | 16 4.38 | 1 4.48 | 0 7 32.08 |
| 25 | 0 17 32.18 | 33.10 | 1 53 59.1 | 65.0 | 9.087 | 58.90 | 6 3.48 | 16 4.10 | 1 4.47 | 0 11 28.64 |
| 26 | 0 21 10.25 | 11.12 | 2 17 31.2 | 36.8 | 9.086 | 58.78 | 5 44.99 | 16 3.82 | 1 4.47 | 0 15 25.19 |
| 27 | 0 24 48.31 | 49.14 | 2 41 0.4 | 5.7 | 9.086 | 58.65 | 5 26.50 | 16 3.54 | 1 4.47 | 0 19 21.79 |
| 28 | 0 28 26.40 | 27.18 | + 3 4 26.5 | 31.5 | 9.088 | +58.51 | + 5 8.04 | 16 3.26 | 1 4.47 | 0 23 18.29 |
| 29 | 0 32 4.53 | 5.26 | 3 27 49.0 | 53.6 | 9.091 | 58.36 | 4 49.63 | 16 2.98 | 1 4.48 | 0 27 14.85 |
| 30 | 0 35 42.73 | 43.41 | 3 51 7.7 | 12.0 | 9.094 | 58.19 | 4 31.29 | 16 2.70 | 1 4.49 | 0 31 11.40 |
| 31 | 0 39 21.03 | 21.66 | 4 14 22.1 | 26.1 | 9.098 | 58.01 | 4 13.04 | 16 2.41 | 1 4.50 | 0 35 7.95 |
| 32 | 0 42 59.44 | 60.03 | 4 37 32.0 | 35.7 | 9.103 | 57.82 | 3 54.89 | 16 2.13 | 1 4.51 | 0 39 4.50 |
| 33 | 0 46 37.97 | 38.52 | + 5 0 37.2 | 40.6 | 9.108 | +57.60 | + 3 36.86 | 16 1.85 | 1 4.53 | 0 43 1.06 |
| 34 | 0 50 16.64 | 17.14 | + 5 23 37.2 | 40.3 | 9.114 | +57.38 | + 3 18.98 | 16 1.56 | 1 4.55 | 0 46 57.61 |

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0°.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

| Date. | Apparent Right Ascension. | | Apparent Declination. | | Hourly Motion. | | Equation of Time for Apparent Noon. | Semi-diameter at Apparent Noon. | Sidereal Time of Semid. Passing Merid. | Sidereal Time of Mean Noon. |
|--------|---------------------------|------------|-----------------------|------------|----------------|--------------|-------------------------------------|---------------------------------|--|-----------------------------|
| | Mean Noon. | App. Noon. | Mean Noon. | App. Noon. | Right Ascen. | Declination. | | | | |
| | h m s | s | ° ' " | " | s | " | m s | ' " | m s | h m s |
| Apr. 1 | 0 42 59.44 | 60.03 | + 4 37 32.0 | 35.7 | 9.103 | +57.82 | +3 54.89 | 16 2.13 | 1 4.51 | 0 39 4.50 |
| 2 | 0 46 37.97 | 38.52 | 5 0 37.2 | 40.6 | 9.108 | 57.60 | 3 36.86 | 16 1.85 | 1 4.53 | 0 43 1.06 |
| 3 | 0 50 16.64 | 17.14 | 5 23 37.2 | 40.3 | 9.114 | 57.38 | 3 18.99 | 16 1.56 | 1 4.55 | 0 46 57.61 |
| 4 | 0 53 55.47 | 55.93 | 5 46 31.5 | 34.3 | 9.121 | 57.14 | 3 1.27 | 16 1.28 | 1 4.57 | 0 50 54.17 |
| 5 | 0 57 34.49 | 34.91 | 6 9 19.9 | 22.4 | 9.130 | 56.88 | 2 43.74 | 16 1.00 | 1 4.60 | 0 54 50.72 |
| 6 | 1 1 13.72 | 14.09 | + 6 32 2.1 | 4.3 | 9.138 | +56.61 | +2 26.41 | 16 0.72 | 1 4.63 | 0 58 47.28 |
| 7 | 1 4 53.15 | 53.47 | 6 54 37.6 | 39.6 | 9.147 | 56.39 | 2 9.30 | 16 0.44 | 1 4.66 | 1 2 43.83 |
| 8 | 1 8 32.81 | 33.09 | 7 17 6.2 | 7.9 | 9.156 | 56.04 | 1 52.41 | 16 0.17 | 1 4.70 | 1 6 40.38 |
| 9 | 1 12 12.71 | 12.95 | 7 39 27.4 | 28.9 | 9.167 | 55.79 | 1 35.76 | 15 59.89 | 1 4.73 | 1 10 36.94 |
| 10 | 1 15 52.87 | 53.07 | 8 1 40.9 | 42.2 | 9.179 | 55.40 | 1 19.37 | 15 59.62 | 1 4.77 | 1 14 33.50 |
| 11 | 1 19 33.29 | 33.45 | + 8 23 46.3 | 47.3 | 9.191 | +55.05 | +1 3.24 | 15 59.35 | 1 4.81 | 1 18 30.05 |
| 12 | 1 23 14.00 | 14.12 | 8 45 43.2 | 43.9 | 9.203 | 54.69 | 0 47.40 | 15 59.08 | 1 4.86 | 1 22 26.61 |
| 13 | 1 26 55.00 | 55.08 | 9 7 31.2 | 31.7 | 9.215 | 54.32 | 0 31.85 | 15 58.81 | 1 4.90 | 1 26 23.16 |
| 14 | 1 30 36.31 | 36.35 | 9 29 10.1 | 10.4 | 9.228 | 53.93 | 0 16.61 | 15 58.55 | 1 4.95 | 1 30 19.71 |
| 15 | 1 34 17.94 | 17.94 | 9 50 39.4 | 39.5 | 9.242 | 53.53 | +0 1.69 | 15 58.29 | 1 5.00 | 1 34 16.26 |
| 16 | 1 37 59.91 | 59.87 | +10 11 58.8 | 58.6 | 9.256 | +53.10 | -0 12.89 | 15 58.03 | 1 5.06 | 1 38 12.81 |
| 17 | 1 41 42.24 | 42.16 | 10 33 8.0 | 7.6 | 9.271 | 52.67 | 0 27.12 | 15 57.77 | 1 5.11 | 1 42 9.37 |
| 18 | 1 45 24.93 | 24.82 | 10 54 6.7 | 6.1 | 9.286 | 52.23 | 0 40.98 | 15 57.51 | 1 5.17 | 1 46 5.93 |
| 19 | 1 49 8.01 | 7.87 | 11 14 54.6 | 53.8 | 9.303 | 51.77 | 0 54.46 | 15 57.25 | 1 5.23 | 1 50 2.48 |
| 20 | 1 52 51.48 | 51.31 | 11 35 31.3 | 30.3 | 9.320 | 51.29 | 1 7.53 | 15 56.99 | 1 5.29 | 1 53 59.03 |
| 21 | 1 56 35.38 | 35.18 | +11 55 58.5 | 55.3 | 9.338 | +50.81 | -1 20.19 | 15 56.74 | 1 5.35 | 1 57 55.59 |
| 22 | 2 0 19.71 | 19.47 | 12 16 9.8 | 8.5 | 9.356 | 50.30 | 1 32.42 | 15 56.49 | 1 5.42 | 2 1 52.14 |
| 23 | 2 4 4.49 | 4.22 | 12 36 10.9 | 9.5 | 9.375 | 49.79 | 1 44.20 | 15 56.23 | 1 5.49 | 2 5 48.70 |
| 24 | 2 7 49.73 | 49.43 | 12 55 59.6 | 58.0 | 9.395 | 49.27 | 1 55.52 | 15 55.98 | 1 5.56 | 2 9 45.26 |
| 25 | 2 11 35.44 | 35.11 | 13 15 35.7 | 34.0 | 9.415 | 48.73 | 2 6.36 | 15 55.73 | 1 5.63 | 2 13 41.81 |
| 26 | 2 15 21.65 | 21.29 | +13 34 58.8 | 57.0 | 9.436 | +48.18 | -2 16.70 | 15 55.48 | 1 5.70 | 2 17 38.36 |
| 27 | 2 19 8.37 | 7.98 | 13 54 8.6 | 6.7 | 9.457 | 47.69 | 2 30.53 | 15 55.23 | 1 5.78 | 2 21 34.92 |
| 28 | 2 22 55.60 | 55.19 | 14 13 4.8 | 2.8 | 9.479 | 47.05 | 2 35.85 | 15 54.98 | 1 5.86 | 2 25 31.47 |
| 29 | 2 26 43.36 | 42.93 | 14 31 47.0 | 44.9 | 9.501 | 46.47 | 2 44.64 | 15 54.73 | 1 5.93 | 2 29 28.03 |
| 30 | 2 30 31.67 | 31.22 | 14 50 15.0 | 12.8 | 9.524 | 45.86 | 2 52.89 | 15 54.48 | 1 6.01 | 2 33 24.58 |
| May 1 | 2 34 20.53 | 20.06 | +15 8 28.4 | 26.2 | 9.547 | +45.25 | -3 0.59 | 15 54.23 | 1 6.08 | 2 37 21.14 |
| 2 | 2 38 9.95 | 9.46 | 15 26 27.0 | 24.7 | 9.571 | 44.62 | 3 7.72 | 15 53.99 | 1 6.16 | 2 41 17.69 |
| 3 | 2 41 59.92 | 59.41 | 15 44 10.3 | 8.0 | 9.594 | 43.98 | 3 14.31 | 15 53.75 | 1 6.24 | 2 45 14.24 |
| 4 | 2 45 50.46 | 49.93 | 16 1 38.1 | 35.8 | 9.618 | 43.33 | 3 20.33 | 15 53.51 | 1 6.32 | 2 49 10.80 |
| 5 | 2 49 41.57 | 41.03 | 16 18 50.2 | 47.8 | 9.641 | 42.67 | 3 25.77 | 15 53.28 | 1 6.40 | 2 53 7.36 |
| 6 | 2 53 33.26 | 32.70 | +16 35 46.1 | 43.6 | 9.665 | +41.98 | -3 30.64 | 15 53.05 | 1 6.48 | 2 57 3.91 |
| 7 | 2 57 25.52 | 24.94 | 16 52 25.5 | 23.0 | 9.689 | 41.29 | 3 34.94 | 15 52.83 | 1 6.56 | 3 1 0.47 |
| 8 | 3 1 18.35 | 17.76 | 17 8 48.1 | 45.6 | 9.713 | 40.59 | 3 38.67 | 15 52.61 | 1 6.64 | 3 4 57.03 |
| 9 | 3 5 11.75 | 11.15 | 17 24 53.5 | 51.0 | 9.737 | 39.86 | 3 41.82 | 15 52.40 | 1 6.72 | 3 8 53.59 |
| 10 | 3 9 5.72 | 5.11 | 17 40 41.5 | 39.0 | 9.761 | 39.13 | 3 44.40 | 15 52.19 | 1 6.80 | 3 12 50.14 |
| 11 | 3 12 60.26 | 59.64 | +17 56 11.7 | 9.2 | 9.785 | +38.39 | -3 46.42 | 15 51.98 | 1 6.88 | 3 16 46.70 |
| 12 | 3 16 55.36 | 54.74 | 18 11 23.8 | 21.4 | 9.808 | 37.63 | 3 47.88 | 15 51.77 | 1 6.97 | 3 20 43.25 |
| 13 | 3 20 51.03 | 50.41 | 18 26 17.5 | 15.1 | 9.831 | 36.86 | 3 48.77 | 15 51.57 | 1 7.05 | 3 24 39.81 |
| 14 | 3 24 47.25 | 46.63 | 18 40 52.5 | 50.2 | 9.854 | 36.07 | 3 49.10 | 15 51.37 | 1 7.13 | 3 28 36.36 |
| 15 | 3 28 44.02 | 43.40 | 18 55 8.6 | 6.3 | 9.877 | 35.27 | 3 48.89 | 15 51.18 | 1 7.21 | 3 32 32.92 |
| 16 | 3 32 41.34 | 40.72 | +19 9 5.4 | 3.2 | 9.900 | +34.47 | -3 48.13 | 15 50.99 | 1 7.30 | 3 36 29.48 |
| 17 | 3 36 39.21 | 38.59 | +19 22 42.7 | 40.5 | 9.923 | +33.65 | -3 46.83 | 15 50.80 | 1 7.38 | 3 40 26.04 |

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0°.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

| Date. | Apparent Right Ascension. | | Apparent Declination. | | Hourly Motion. | | Equation of Time for Apparent Noon. | Semi-diameter at Apparent Noon. | Sidereal Time of Semid. Passing Merid. | Sidereal Time of Mean Noon. |
|--------|---------------------------|------------|-----------------------|------------|----------------|--------------|-------------------------------------|---------------------------------|--|-----------------------------|
| | Mean Noon. | App. Noon. | Mean Noon. | App. Noon. | Right Ascen. | Declination. | | | | |
| | h m s | s | ° ' " | " | s | " | m s | ' " | m s | h m s |
| May 17 | 3 36 39.21 | 38.59 | +19 22 42.7 | 40.5 | 9.923 | +33.65 | -3 46.83 | 15 50.80 | 1 7.38 | 3 40 26.04 |
| 18 | 3 40 37.62 | 37.00 | 19 35 60.2 | 58.1 | 9.945 | 32.82 | 3 44.98 | 15 50.62 | 1 7.46 | 3 44 22.60 |
| 19 | 3 44 36.57 | 35.95 | 19 48 57.7 | 55.7 | 9.968 | 31.98 | 3 42.58 | 15 50.44 | 1 7.54 | 3 48 19.15 |
| 20 | 3 48 36.05 | 35.44 | 20 1 34.9 | 33.0 | 9.990 | 31.13 | 3 39.65 | 15 50.26 | 1 7.62 | 3 52 15.70 |
| 21 | 3 52 36.07 | 35.47 | 20 13 51.6 | 49.7 | 10.012 | 30.27 | 3 36.19 | 15 50.08 | 1 7.70 | 3 56 12.26 |
| 22 | 3 56 36.62 | 36.03 | +20 25 47.6 | 45.8 | 10.034 | +29.39 | -3 32.21 | 15 49.91 | 1 7.77 | 4 0 8.82 |
| 23 | 4 0 37.69 | 37.11 | 20 37 22.6 | 20.9 | 10.055 | 28.51 | 3 27.70 | 15 49.73 | 1 7.85 | 4 4 5.38 |
| 24 | 4 4 39.28 | 38.71 | 20 48 36.4 | 34.8 | 10.076 | 27.63 | 3 22.67 | 15 49.56 | 1 7.92 | 4 8 1.94 |
| 25 | 4 8 41.38 | 40.83 | 20 59 29.8 | 27.3 | 10.098 | 26.73 | 3 17.12 | 15 49.40 | 1 7.99 | 4 11 58.49 |
| 26 | 4 12 43.99 | 43.45 | 21 9 50.7 | 58.3 | 10.119 | 25.83 | 3 11.07 | 15 49.24 | 1 8.06 | 4 15 55.05 |
| 27 | 4 16 47.09 | 46.56 | +21 20 8.7 | 7.4 | 10.139 | +24.91 | -3 4.53 | 15 49.08 | 1 8.12 | 4 19 51.61 |
| 28 | 4 20 50.67 | 50.16 | 21 29 55.7 | 54.5 | 10.159 | 23.99 | 2 57.50 | 15 48.92 | 1 8.18 | 4 23 48.16 |
| 29 | 4 24 54.73 | 54.24 | 21 39 20.4 | 19.3 | 10.179 | 23.06 | 2 49.99 | 15 48.76 | 1 8.24 | 4 27 44.72 |
| 30 | 4 28 59.26 | 58.79 | 21 48 22.8 | 21.8 | 10.198 | 22.13 | 2 42.02 | 15 48.61 | 1 8.30 | 4 31 41.28 |
| 31 | 4 33 4.24 | 3.79 | 21 57 2.5 | 1.6 | 10.216 | 21.18 | 2 33.60 | 15 48.46 | 1 8.36 | 4 35 37.84 |
| June 1 | 4 37 9.66 | 9.24 | +22 5 19.4 | 18.6 | 10.234 | +20.22 | -2 24.74 | 15 48.32 | 1 8.42 | 4 39 34.39 |
| 2 | 4 41 15.50 | 15.11 | 22 13 13.3 | 12.6 | 10.251 | 19.26 | 2 15.46 | 15 48.18 | 1 8.48 | 4 43 30.95 |
| 3 | 4 45 21.73 | 21.37 | 22 20 44.0 | 43.4 | 10.267 | 18.29 | 2 5.79 | 15 48.04 | 1 8.53 | 4 47 27.51 |
| 4 | 4 49 28.32 | 27.99 | 22 27 51.3 | 50.7 | 10.282 | 17.31 | 1 55.75 | 15 47.91 | 1 8.58 | 4 51 24.07 |
| 5 | 4 53 35.27 | 34.97 | 22 34 35.0 | 34.5 | 10.297 | 16.33 | 1 45.34 | 15 47.79 | 1 8.63 | 4 55 20.62 |
| 6 | 4 57 42.58 | 42.31 | +22 40 55.1 | 54.7 | 10.310 | +15.34 | -1 34.61 | 15 47.67 | 1 8.67 | 4 59 17.18 |
| 7 | 5 1 50.19 | 49.95 | 22 46 51.3 | 51.0 | 10.322 | 14.35 | 1 23.57 | 15 47.56 | 1 8.71 | 5 3 13.74 |
| 8 | 5 5 58.08 | 57.87 | 22 52 23.6 | 23.3 | 10.333 | 13.35 | 1 12.24 | 15 47.45 | 1 8.75 | 5 7 10.30 |
| 9 | 5 10 6.23 | 6.05 | 22 57 31.7 | 31.5 | 10.344 | 12.34 | 1 0.64 | 15 47.35 | 1 8.79 | 5 11 6.86 |
| 10 | 5 14 14.61 | 14.47 | 23 2 15.5 | 15.4 | 10.354 | 11.33 | 0 48.81 | 15 47.25 | 1 8.83 | 5 15 3.41 |
| 11 | 5 18 23.21 | 23.11 | +23 6 35.0 | 35.0 | 10.362 | +10.31 | -0 36.77 | 15 47.15 | 1 8.86 | 5 18 59.97 |
| 12 | 5 22 32.00 | 31.93 | 23 10 30.1 | 30.1 | 10.369 | 9.29 | 0 24.54 | 15 47.06 | 1 8.88 | 5 22 56.53 |
| 13 | 5 26 40.95 | 40.92 | 23 14 0.6 | 0.6 | 10.376 | 8.26 | -0 12.14 | 15 46.98 | 1 8.90 | 5 26 53.09 |
| 14 | 5 30 50.04 | 50.05 | 23 17 6.5 | 6.5 | 10.381 | 7.23 | +0 0.39 | 15 46.91 | 1 8.92 | 5 30 49.65 |
| 15 | 5 34 59.24 | 59.28 | 23 19 47.7 | 47.7 | 10.386 | 6.20 | 0 13.04 | 15 46.84 | 1 8.94 | 5 34 46.21 |
| 16 | 5 39 8.54 | 8.61 | +23 22 4.2 | 4.2 | 10.389 | +5.17 | +0 25.79 | 15 46.77 | 1 8.96 | 5 38 42.77 |
| 17 | 5 43 17.92 | 18.03 | 23 23 56.0 | 56.0 | 10.391 | 4.14 | 0 38.61 | 15 46.70 | 1 8.97 | 5 42 39.32 |
| 18 | 5 47 27.35 | 27.49 | 23 25 23.0 | 23.0 | 10.393 | 3.11 | 0 51.48 | 15 46.63 | 1 8.98 | 5 46 35.88 |
| 19 | 5 51 36.81 | 36.99 | 23 26 25.3 | 25.3 | 10.394 | 2.07 | 1 4.38 | 15 46.57 | 1 8.98 | 5 50 32.44 |
| 20 | 5 55 46.28 | 46.50 | 23 27 2.8 | 2.8 | 10.394 | 1.04 | 1 17.29 | 15 46.51 | 1 8.98 | 5 54 29.00 |
| 21 | 5 59 55.74 | 56.00 | +23 27 15.5 | 15.5 | 10.394 | +0.01 | +1 30.19 | 15 46.46 | 1 8.98 | 5 58 25.56 |
| 22 | 6 4 5.17 | 5.47 | 23 27 3.5 | 3.4 | 10.393 | -1.02 | 1 43.06 | 15 46.41 | 1 8.98 | 6 2 22.12 |
| 23 | 6 8 14.56 | 14.89 | 23 26 26.6 | 26.5 | 10.390 | 2.05 | 1 55.90 | 15 46.36 | 1 8.97 | 6 6 18.67 |
| 24 | 6 12 23.88 | 24.25 | 23 25 25.0 | 24.9 | 10.387 | 3.08 | 2 8.67 | 15 46.32 | 1 8.96 | 6 10 15.23 |
| 25 | 6 16 33.12 | 33.53 | 23 23 58.8 | 58.6 | 10.383 | 4.11 | 2 21.35 | 15 46.29 | 1 8.94 | 6 14 11.79 |
| 26 | 6 20 42.25 | 42.69 | +23 22 7.9 | 7.7 | 10.378 | -5.14 | +2 33.92 | 15 46.25 | 1 8.92 | 6 18 8.35 |
| 27 | 6 24 51.25 | 51.73 | 23 19 52.4 | 52.2 | 10.373 | 6.16 | 2 46.36 | 15 46.21 | 1 8.90 | 6 22 4.91 |
| 28 | 6 29 0.11 | 0.62 | 23 17 12.4 | 12.1 | 10.368 | 7.18 | 2 58.66 | 15 46.18 | 1 8.87 | 6 26 1.47 |
| 29 | 6 33 8.80 | 9.34 | 23 14 7.8 | 7.4 | 10.359 | 8.20 | 3 10.80 | 15 46.16 | 1 8.84 | 6 29 58.03 |
| 30 | 6 37 17.29 | 17.87 | 23 10 38.8 | 38.3 | 10.350 | 9.21 | 3 22.74 | 15 46.14 | 1 8.81 | 6 33 54.53 |
| 31 | 6 41 25.57 | 26.19 | +23 6 45.4 | 44.8 | 10.340 | -10.22 | +3 34.46 | 15 46.12 | 1 8.78 | 6 37 51.14 |
| 32 | 6 45 33.61 | 34.26 | +23 2 27.8 | 27.1 | 10.330 | -11.23 | +3 45.94 | 15 46.11 | 1 8.74 | 6 41 47.70 |

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0°.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

| Date. | Apparent Right Ascension. | | Apparent Declination. | | Hourly Motion. | | Equation of Time for Apparent Noon. | Semi-diameter at Apparent Noon. | Sidereal Time of Semid. Passing Merid. | Sidereal Time of Mean Noon. |
|--------|--|--------------|--|------------|----------------|--------------|-------------------------------------|---------------------------------|--|--|
| | Mean Noon. | App. Noon. | Mean Noon. | App. Noon. | Right Ascen. | Declination. | | | | |
| | ^h ^m ^s | ^s | [°] ['] ["] | | ^s | ["] | ^m ^s | ['] ["] | ^m ^s | ^h ^m ^s |
| July 1 | 6 41 25.57 | 26.19 | +23 6 45.4 | 44.8 | 10.340 | -10.29 | +3 34.46 | 15 46.12 | 1 8.78 | 6 37 51.14 |
| 2 | 6 45 33.61 | 34.26 | 23 2 27.8 | 27.1 | 10.330 | 11.23 | 3 45.94 | 15 46.11 | 1 8.74 | 6 41 47.70 |
| 3 | 6 49 41.39 | 42.07 | 22 57 46.1 | 45.3 | 10.318 | 12.23 | 3 57.16 | 15 46.10 | 1 8.70 | 6 45 44.26 |
| 4 | 6 53 49.87 | 49.58 | 22 52 40.3 | 39.4 | 10.305 | 13.24 | 4 8.09 | 15 46.10 | 1 8.66 | 6 49 40.81 |
| 5 | 6 57 56.05 | 56.79 | 22 47 10.6 | 9.6 | 10.292 | 14.23 | 4 18.71 | 15 46.11 | 1 8.61 | 6 53 37.37 |
| 6 | 7 2 2.90 | 3.66 | +22 41 17.1 | 16.0 | 10.278 | -15.22 | +4 29.00 | 15 46.12 | 1 8.56 | 6 57 33.93 |
| 7 | 7 6 9.39 | 10.18 | 22 34 60.0 | 58.8 | 10.263 | 16.21 | 4 38.93 | 15 46.14 | 1 8.51 | 7 1 30.49 |
| 8 | 7 10 15.50 | 16.31 | 22 28 19.4 | 18.1 | 10.246 | 17.18 | 4 48.48 | 15 46.17 | 1 8.46 | 7 5 27.05 |
| 9 | 7 14 21.20 | 22.03 | 22 21 15.4 | 14.0 | 10.229 | 18.15 | 4 57.62 | 15 46.20 | 1 8.40 | 7 9 23.61 |
| 10 | 7 18 26.47 | 27.33 | 22 13 48.3 | 46.8 | 10.211 | 19.10 | 5 6.34 | 15 46.23 | 1 8.34 | 7 13 20.17 |
| 11 | 7 22 31.30 | 32.18 | +22 5 58.2 | 56.5 | 10.192 | -20.05 | +5 14.61 | 15 46.27 | 1 8.28 | 7 17 16.73 |
| 12 | 7 26 35.67 | 36.57 | 21 57 45.3 | 43.5 | 10.172 | 20.99 | 5 22.43 | 15 46.31 | 1 8.22 | 7 21 13.28 |
| 13 | 7 30 39.57 | 40.49 | 21 49 9.8 | 7.8 | 10.152 | 21.93 | 5 29.76 | 15 46.36 | 1 8.15 | 7 25 9.84 |
| 14 | 7 34 42.97 | 43.91 | 21 40 11.9 | 9.8 | 10.131 | 22.86 | 5 36.60 | 15 46.41 | 1 8.09 | 7 29 6.40 |
| 15 | 7 38 45.86 | 46.82 | 21 30 51.9 | 49.6 | 10.109 | 23.78 | 5 42.93 | 15 46.47 | 1 8.02 | 7 33 2.96 |
| 16 | 7 42 48.23 | 49.21 | +21 21 10.0 | 7.6 | 10.087 | -24.69 | +5 48.75 | 15 46.53 | 1 7.95 | 7 36 59.51 |
| 17 | 7 46 50.07 | 51.06 | 21 11 6.4 | 3.9 | 10.065 | 25.60 | 5 54.03 | 15 46.60 | 1 7.88 | 7 40 56.07 |
| 18 | 7 50 51.37 | 52.37 | 21 0 41.2 | 38.6 | 10.043 | 26.49 | 5 58.77 | 15 46.67 | 1 7.80 | 7 44 52.63 |
| 19 | 7 54 52.13 | 53.13 | 20 49 54.8 | 52.0 | 10.020 | 27.38 | 6 2.96 | 15 46.75 | 1 7.72 | 7 48 49.18 |
| 20 | 7 58 52.33 | 53.34 | 20 38 47.3 | 44.4 | 9.997 | 28.24 | 6 6.60 | 15 46.83 | 1 7.64 | 7 52 45.74 |
| 21 | 8 2 51.97 | 52.99 | +20 27 19.1 | 16.1 | 9.973 | -29.10 | +6 9.68 | 15 46.91 | 1 7.56 | 7 56 42.30 |
| 22 | 8 6 51.05 | 52.08 | 20 15 30.3 | 27.2 | 9.950 | 29.96 | 6 12.20 | 15 46.99 | 1 7.48 | 8 0 38.86 |
| 23 | 8 10 49.57 | 50.60 | 20 3 21.1 | 17.9 | 9.926 | 30.80 | 6 14.16 | 15 47.07 | 1 7.40 | 8 4 35.42 |
| 24 | 8 14 47.52 | 48.55 | 19 50 51.9 | 48.6 | 9.903 | 31.63 | 6 15.56 | 15 47.16 | 1 7.32 | 8 8 31.97 |
| 25 | 8 18 44.90 | 45.92 | 19 37 62.9 | 59.5 | 9.879 | 32.44 | 6 16.38 | 15 47.25 | 1 7.23 | 8 12 28.53 |
| 26 | 8 22 41.70 | 42.72 | +19 24 54.3 | 50.8 | 9.855 | -33.25 | +6 16.62 | 15 47.34 | 1 7.15 | 8 16 25.09 |
| 27 | 8 26 37.92 | 38.94 | 19 11 26.3 | 22.7 | 9.831 | 34.05 | 6 16.29 | 15 47.44 | 1 7.06 | 8 20 21.64 |
| 28 | 8 30 33.57 | 34.59 | 18 57 39.2 | 35.6 | 9.807 | 34.85 | 6 15.38 | 15 47.54 | 1 6.98 | 8 24 18.20 |
| 29 | 8 34 28.64 | 29.66 | 18 43 33.3 | 29.7 | 9.783 | 35.62 | 6 13.89 | 15 47.65 | 1 6.89 | 8 28 14.75 |
| 30 | 8 38 23.13 | 24.14 | 18 29 8.9 | 5.2 | 9.759 | 36.39 | 6 11.81 | 15 47.76 | 1 6.80 | 8 32 11.31 |
| 31 | 8 42 17.02 | 18.02 | +18 14 26.2 | 22.4 | 9.734 | -37.15 | +6 9.14 | 15 47.88 | 1 6.71 | 8 36 7.87 |
| Aug. 1 | 8 46 10.32 | 11.31 | 17 59 25.5 | 21.7 | 9.709 | 37.90 | 6 5.89 | 15 48.00 | 1 6.62 | 8 40 4.43 |
| 2 | 8 50 3.03 | 4.00 | 17 44 7.1 | 3.2 | 9.684 | 38.63 | 6 2.04 | 15 48.12 | 1 6.54 | 8 44 0.99 |
| 3 | 8 53 55.15 | 56.10 | 17 28 31.3 | 27.4 | 9.659 | 39.34 | 5 57.30 | 15 48.25 | 1 6.45 | 8 47 57.54 |
| 4 | 8 57 46.67 | 47.61 | 17 12 38.4 | 34.5 | 9.634 | 40.05 | 5 52.56 | 15 48.38 | 1 6.36 | 8 51 54.09 |
| 5 | 9 1 37.59 | 38.52 | +16 56 28.7 | 24.8 | 9.610 | -40.75 | +5 46.93 | 15 48.52 | 1 6.27 | 8 55 50.64 |
| 6 | 9 5 27.91 | 28.82 | 16 39 62.5 | 58.6 | 9.585 | 41.43 | 5 40.69 | 15 48.67 | 1 6.19 | 8 59 47.20 |
| 7 | 9 9 17.63 | 18.52 | 16 23 20.1 | 16.2 | 9.560 | 42.10 | 5 33.84 | 15 48.82 | 1 6.10 | 9 3 43.76 |
| 8 | 9 13 6.75 | 7.62 | 16 6 21.9 | 18.1 | 9.534 | 42.75 | 5 26.40 | 15 48.97 | 1 6.02 | 9 7 40.32 |
| 9 | 9 16 55.27 | 56.12 | 15 49 8.2 | 4.5 | 9.509 | 43.38 | 5 18.36 | 15 49.14 | 1 5.93 | 9 11 36.88 |
| 10 | 9 20 43.20 | 44.02 | +15 31 39.3 | 35.6 | 9.485 | -44.01 | +5 9.74 | 15 49.31 | 1 5.85 | 9 15 33.44 |
| 11 | 9 24 30.54 | 31.33 | 15 13 55.5 | 51.8 | 9.460 | 44.63 | 5 0.53 | 15 49.48 | 1 5.77 | 9 19 29.99 |
| 12 | 9 28 17.30 | 18.06 | 14 55 57.1 | 53.5 | 9.436 | 45.23 | 4 50.74 | 15 49.65 | 1 5.69 | 9 23 26.54 |
| 13 | 9 32 3.49 | 4.22 | 14 37 44.5 | 41.0 | 9.412 | 45.80 | 4 40.37 | 15 49.83 | 1 5.61 | 9 27 23.10 |
| 14 | 9 35 49.11 | 49.81 | 14 19 18.1 | 14.6 | 9.389 | 46.38 | 4 29.44 | 15 50.01 | 1 5.53 | 9 31 19.65 |
| 15 | 9 39 34.18 | 34.85 | +14 0 38.0 | 34.6 | 9.366 | -46.95 | +4 17.95 | 15 50.19 | 1 5.45 | 9 35 16.21 |
| 16 | 9 43 18.71 | 19.35 | +13 41 44.6 | 41.3 | 9.344 | -47.50 | +4 5.92 | 15 50.37 | 1 5.37 | 9 39 12.76 |

NOTE. - For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

| Date. | Apparent Right Ascension. | | Apparent Declination. | | Hourly Motion. | | Equation of Time for Apparent Noon. | Semi-diameter at Apparent Noon. | Sidereal Time of Semid. Passing Merid. | Sidereal Time of Mean Noon. |
|---------|--|--------------|--|--------------|----------------|--------------|-------------------------------------|---------------------------------|--|--|
| | Mean Noon. | App. Noon. | Mean Noon. | App. Noon. | Right Ascen. | Declination. | | | | |
| | ^h ^m ^s | ^s | [°] ['] ["] | ["] | ^s | ["] | ^m ^s | ['] ["] | ^m ^s | ^h ^m ^s |
| Aug. 16 | 9 43 18.71 | 19.35 | +13 41 44.6 | 41.3 | 9.344 | -47.50 | + 4 5.92 | 15 50.37 | 1 5.37 | 9 39 12.76 |
| 17 | 9 47 2.71 | 3.32 | 13 22 38.2 | 35.0 | 9.323 | 48.03 | 3 53.36 | 15 50.56 | 1 5.29 | 9 43 9.32 |
| 18 | 9 50 46.19 | 46.76 | 13 3 19.2 | 16.2 | 9.302 | 48.55 | 3 40.29 | 15 50.75 | 1 5.22 | 9 47 5.87 |
| 19 | 9 54 29.17 | 29.70 | 12 43 47.8 | 44.9 | 9.282 | 49.06 | 3 26.72 | 15 50.94 | 1 5.15 | 9 51 2.43 |
| 20 | 9 58 11.67 | 12.16 | 12 24 4.3 | 1.6 | 9.262 | 49.55 | 3 12.67 | 15 51.13 | 1 5.08 | 9 54 58.98 |
| 21 | 10 1 53.70 | 54.15 | +12 4 9.0 | 6.5 | 9.243 | -50.04 | + 2 58.15 | 15 51.32 | 1 5.02 | 9 58 55.53 |
| 22 | 10 5 35.28 | 35.70 | 11 43 62.2 | 59.9 | 9.224 | 50.52 | 2 43.17 | 15 51.52 | 1 4.96 | 10 2 52.09 |
| 23 | 10 9 16.43 | 16.81 | 11 23 44.3 | 42.2 | 9.206 | 50.96 | 2 27.76 | 15 51.72 | 1 4.89 | 10 6 48.65 |
| 24 | 10 12 57.16 | 57.50 | 11 3 15.5 | 13.6 | 9.188 | 51.42 | 2 11.93 | 15 51.92 | 1 4.83 | 10 10 45.20 |
| 25 | 10 16 37.47 | 37.77 | 10 42 36.1 | 34.4 | 9.172 | 51.86 | 1 55.70 | 15 52.12 | 1 4.77 | 10 14 41.76 |
| 26 | 10 20 17.40 | 17.65 | +10 21 46.4 | 44.9 | 9.156 | -52.38 | + 1 39.07 | 15 52.33 | 1 4.71 | 10 18 38.31 |
| 27 | 10 23 56.96 | 57.17 | 10 0 46.6 | 45.3 | 9.141 | 52.89 | 1 22.07 | 15 52.54 | 1 4.65 | 10 22 34.87 |
| 28 | 10 27 36.17 | 36.33 | 9 39 37.2 | 36.2 | 9.126 | 53.08 | 1 4.73 | 15 52.75 | 1 4.60 | 10 26 31.42 |
| 29 | 10 31 15.03 | 15.15 | 9 18 18.5 | 17.8 | 9.112 | 53.46 | 0 47.05 | 15 52.97 | 1 4.55 | 10 30 27.97 |
| 30 | 10 34 53.56 | 53.64 | 8 56 50.8 | 50.4 | 9.099 | 53.84 | 0 29.04 | 15 53.19 | 1 4.50 | 10 34 24.52 |
| 31 | 10 38 31.78 | 31.81 | + 8 35 14.3 | 14.2 | 9.086 | -54.19 | + 0 10.70 | 15 53.41 | 1 4.45 | 10 38 21.08 |
| Sept. 1 | 10 42 9.69 | 9.67 | 8 13 29.4 | 29.6 | 9.073 | 54.53 | - 0 7.94 | 15 53.64 | 1 4.40 | 10 42 17.64 |
| 2 | 10 45 47.31 | 47.25 | 7 51 36.5 | 37.0 | 9.062 | 54.86 | 0 26.87 | 15 53.87 | 1 4.35 | 10 46 14.19 |
| 3 | 10 49 24.66 | 24.55 | 7 29 36.0 | 36.8 | 9.051 | 55.17 | 0 46.07 | 15 54.10 | 1 4.31 | 10 50 10.74 |
| 4 | 10 53 1.76 | 1.60 | 7 7 28.1 | 29.2 | 9.040 | 55.47 | 1 5.53 | 15 54.34 | 1 4.27 | 10 54 7.30 |
| 5 | 10 56 38.61 | 38.40 | + 6 45 13.2 | 14.6 | 9.030 | -55.76 | - 1 25.23 | 15 54.58 | 1 4.24 | 10 58 3.85 |
| 6 | 11 0 15.22 | 14.96 | 6 22 51.6 | 53.3 | 9.021 | 56.03 | 1 45.16 | 15 54.82 | 1 4.21 | 11 2 0.40 |
| 7 | 11 3 51.62 | 51.31 | 6 0 23.8 | 25.8 | 9.012 | 56.28 | 2 5.31 | 15 55.07 | 1 4.18 | 11 5 56.95 |
| 8 | 11 7 27.82 | 27.46 | 5 37 50.1 | 52.4 | 9.004 | 56.52 | 2 25.66 | 15 55.32 | 1 4.16 | 11 9 53.51 |
| 9 | 11 11 3.83 | 3.42 | 5 15 10.8 | 13.5 | 8.997 | 56.74 | 2 46.20 | 15 55.58 | 1 4.14 | 11 13 50.07 |
| 10 | 11 14 39.67 | 39.21 | + 4 52 26.3 | 29.3 | 8.991 | -56.95 | - 3 6.90 | 15 55.84 | 1 4.12 | 11 17 46.62 |
| 11 | 11 18 15.37 | 14.86 | 4 29 36.9 | 40.2 | 8.985 | 57.15 | 3 27.75 | 15 56.10 | 1 4.10 | 11 21 43.17 |
| 12 | 11 21 50.94 | 50.38 | 4 6 42.9 | 46.5 | 8.980 | 57.34 | 3 48.74 | 15 56.36 | 1 4.08 | 11 25 39.73 |
| 13 | 11 25 26.40 | 25.78 | 3 43 44.6 | 48.6 | 8.978 | 57.50 | 4 9.82 | 15 56.62 | 1 4.07 | 11 29 36.28 |
| 14 | 11 29 1.78 | 1.11 | 3 20 42.4 | 46.8 | 8.973 | 57.66 | 4 30.99 | 15 56.88 | 1 4.06 | 11 33 32.83 |
| 15 | 11 32 37.09 | 36.37 | + 2 57 36.7 | 41.4 | 8.971 | -57.81 | - 4 52.22 | 15 57.15 | 1 4.05 | 11 37 29.38 |
| 16 | 11 36 12.36 | 11.59 | 2 34 27.7 | 32.7 | 8.970 | 57.94 | 5 13.50 | 15 57.41 | 1 4.05 | 11 41 25.94 |
| 17 | 11 39 47.61 | 46.78 | 2 11 15.7 | 21.1 | 8.970 | 58.05 | 5 34.80 | 15 57.67 | 1 4.05 | 11 45 22.49 |
| 18 | 11 43 22.86 | 21.98 | 1 48 1.0 | 6.8 | 8.970 | 58.16 | 5 56.09 | 15 57.93 | 1 4.05 | 11 49 19.04 |
| 19 | 11 46 58.14 | 57.21 | 1 24 44.1 | 50.2 | 8.972 | 58.25 | 6 17.36 | 15 58.20 | 1 4.06 | 11 53 15.60 |
| 20 | 11 50 33.48 | 32.50 | + 1 1 25.1 | 31.5 | 8.975 | -58.32 | - 6 38.57 | 15 58.46 | 1 4.07 | 11 57 12.15 |
| 21 | 11 54 8.90 | 7.86 | 0 38 4.4 | 11.2 | 8.978 | 58.39 | 6 59.70 | 15 58.73 | 1 4.08 | 12 1 8.71 |
| 22 | 11 57 44.42 | 43.33 | + 0 14 42.3 | 49.4 | 8.982 | 58.45 | 7 20.74 | 15 58.99 | 1 4.09 | 12 5 5.26 |
| 23 | 12 1 20.06 | 18.91 | - 0 8 41.0 | 33.5 | 8.987 | 58.49 | 7 41.65 | 15 59.26 | 1 4.11 | 12 9 1.81 |
| 24 | 12 4 55.85 | 54.64 | 0 31 65.0 | 57.2 | 8.994 | 58.51 | 8 2.41 | 15 59.52 | 1 4.13 | 12 12 58.37 |
| 25 | 12 8 31.79 | 30.53 | - 0 55 29.4 | 21.2 | 9.002 | -58.52 | - 8 23.00 | 15 59.79 | 1 4.15 | 12 16 54.92 |
| 26 | 12 12 7.92 | 6.61 | 1 18 53.9 | 45.4 | 9.010 | 58.52 | 8 43.42 | 16 0.06 | 1 4.18 | 12 20 51.47 |
| 27 | 12 15 44.27 | 42.91 | 1 42 18.2 | 9.3 | 9.019 | 58.50 | 9 3.62 | 16 0.33 | 1 4.21 | 12 24 48.02 |
| 28 | 12 19 20.84 | 19.43 | 2 5 41.9 | 32.7 | 9.029 | 58.47 | 9 23.60 | 16 0.60 | 1 4.24 | 12 28 44.57 |
| 29 | 12 22 57.66 | 56.19 | 2 28 64.7 | 55.3 | 9.039 | 58.42 | 9 43.33 | 16 0.87 | 1 4.28 | 12 32 41.13 |
| 30 | 12 26 34.74 | 33.22 | - 2 52 26.2 | 16.4 | 9.050 | -58.36 | -10 2.80 | 16 1.14 | 1 4.32 | 12 36 37.68 |
| 31 | 12 30 12.11 | 10.54 | - 3 15 46.0 | 35.9 | 9.063 | -58.28 | -10 21.99 | 16 1.41 | 1 4.36 | 12 40 34.23 |

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0°.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

| Date. | Apparent Right Ascension. | | Apparent Declination. | | Hourly Motion. | | Equation of Time for Apparent Noon. | Semi-diameter at Apparent Noon. | Sidereal Time of Semid. Passing Merid. | Sidereal Time of Mean Noon. |
|--------|---------------------------|------------|-----------------------|------------|----------------|--------------|-------------------------------------|---------------------------------|--|-----------------------------|
| | Mean Noon. | App. Noon. | Mean Noon. | App. Noon. | Right Ascen. | Declination. | | | | |
| | h m s | s | ° ' " | " | s | " | m s | ' " | m s | h m s |
| Oct. 1 | 12 30 12.11 | 10.54 | - 3 15 46.0 | 35.9 | 9.063 | -58.36 | -10 21.99 | 16 1.41 | 1 4.36 | 12 40 34.23 |
| 2 | 12 33 49.77 | 48.15 | 3 38 63.7 | 53.3 | 9.076 | 58.18 | 10 40.88 | 16 1.68 | 1 4.40 | 12 44 30.79 |
| 3 | 12 37 27.75 | 26.08 | 4 2 19.0 | 8.3 | 9.089 | 58.07 | 10 59.45 | 16 1.96 | 1 4.45 | 12 48 27.34 |
| 4 | 12 41 6.05 | 4.33 | 4 25 31.4 | 20.5 | 9.103 | 57.95 | 11 17.70 | 16 2.25 | 1 4.50 | 12 52 23.90 |
| 5 | 12 44 44.70 | 42.93 | 4 48 40.6 | 29.5 | 9.118 | 57.81 | 11 35.60 | 16 2.53 | 1 4.55 | 12 56 20.45 |
| 6 | 12 48 23.72 | 21.90 | - 5 11 46.2 | 34.8 | 9.133 | -57.65 | -11 53.14 | 16 2.81 | 1 4.61 | 13 0 17.00 |
| 7 | 12 52 3.11 | 1.25 | 5 34 47.8 | 36.2 | 9.150 | 57.47 | 12 10.30 | 16 3.09 | 1 4.67 | 13 4 13.55 |
| 8 | 12 55 42.91 | 41.00 | 5 57 45.0 | 33.9 | 9.167 | 57.98 | 12 27.06 | 16 3.38 | 1 4.73 | 13 8 10.11 |
| 9 | 12 59 23.12 | 21.17 | 6 20 37.4 | 25.4 | 9.185 | 57.07 | 12 43.40 | 16 3.66 | 1 4.80 | 13 12 6.66 |
| 10 | 13 3 3.77 | 1.78 | 6 43 24.6 | 12.4 | 9.202 | 56.85 | 12 59.31 | 16 3.94 | 1 4.87 | 13 16 3.22 |
| 11 | 13 6 44.88 | 42.84 | - 7 5 66.3 | 53.9 | 9.222 | -56.69 | -13 14.76 | 16 4.22 | 1 4.94 | 13 19 59.77 |
| 12 | 13 10 26.46 | 24.37 | 7 28 42.0 | 29.4 | 9.242 | 56.36 | 13 29.73 | 16 4.50 | 1 5.01 | 13 23 56.33 |
| 13 | 13 14 8.53 | 6.40 | 7 50 71.5 | 58.7 | 9.264 | 56.09 | 13 44.21 | 16 4.78 | 1 5.09 | 13 27 52.88 |
| 14 | 13 17 51.11 | 48.94 | 8 13 34.3 | 21.4 | 9.286 | 55.81 | 13 58.18 | 16 5.06 | 1 5.17 | 13 31 49.43 |
| 15 | 13 21 34.23 | 32.02 | 8 35 50.2 | 37.2 | 9.308 | 55.50 | 14 11.62 | 16 5.34 | 1 5.25 | 13 35 45.98 |
| 16 | 13 25 17.90 | 15.65 | - 8 57 58.7 | 45.8 | 9.332 | -55.19 | -14 24.50 | 16 5.62 | 1 5.33 | 13 39 42.53 |
| 17 | 13 28 62.16 | 59.87 | 9 19 59.4 | 46.2 | 9.356 | 54.86 | 14 36.81 | 16 5.89 | 1 5.42 | 13 43 39.09 |
| 18 | 13 32 47.01 | 44.68 | 9 41 52.1 | 38.8 | 9.382 | 54.52 | 14 48.52 | 16 6.16 | 1 5.51 | 13 47 35.65 |
| 19 | 13 36 32.47 | 20.11 | 10 3 36.4 | 23.0 | 9.408 | 54.16 | 14 59.62 | 16 6.43 | 1 5.60 | 13 51 32.20 |
| 20 | 13 40 18.57 | 16.17 | 10 24 71.8 | 58.3 | 9.435 | 53.79 | 15 10.08 | 16 6.70 | 1 5.69 | 13 55 28.76 |
| 21 | 13 44 5.33 | 2.90 | -10 46 38.0 | 24.4 | 9.463 | -53.39 | -15 19.88 | 16 6.96 | 1 5.79 | 13 59 25.31 |
| 22 | 13 47 52.77 | 50.31 | 11 7 54.7 | 41.0 | 9.491 | 52.99 | 15 29.00 | 16 7.23 | 1 5.89 | 14 3 21.87 |
| 23 | 13 51 40.91 | 38.42 | 11 28 61.6 | 47.8 | 9.520 | 52.57 | 15 37.43 | 16 7.49 | 1 5.99 | 14 7 18.42 |
| 24 | 13 55 29.75 | 27.24 | 11 49 58.1 | 44.4 | 9.550 | 52.14 | 15 45.15 | 16 7.75 | 1 6.09 | 14 11 14.98 |
| 25 | 13 59 19.31 | 16.78 | 12 10 43.9 | 30.9 | 9.580 | 51.69 | 15 52.15 | 16 8.01 | 1 6.19 | 14 15 11.53 |
| 26 | 14 3 9.62 | 7.06 | -12 31 18.6 | 4.9 | 9.612 | -51.21 | -15 58.40 | 16 8.26 | 1 6.29 | 14 19 8.09 |
| 27 | 14 6 60.69 | 58.10 | 12 51 41.9 | 28.2 | 9.644 | 50.73 | 16 3.90 | 16 8.51 | 1 6.40 | 14 23 4.64 |
| 28 | 14 10 52.51 | 49.91 | 13 11 53.2 | 39.7 | 9.676 | 50.21 | 16 8.64 | 16 8.76 | 1 6.51 | 14 27 1.20 |
| 29 | 14 14 45.11 | 42.49 | 13 31 52.2 | 38.8 | 9.708 | 49.68 | 16 12.60 | 16 9.01 | 1 6.62 | 14 30 57.75 |
| 30 | 14 18 38.49 | 35.85 | 13 51 38.4 | 25.1 | 9.741 | 49.14 | 16 15.79 | 16 9.26 | 1 6.73 | 14 34 54.30 |
| 31 | 14 22 32.66 | 30.00 | -14 10 71.4 | 58.2 | 9.774 | -48.59 | -16 18.19 | 16 9.51 | 1 6.84 | 14 38 50.86 |
| Nov. 1 | 14 26 27.62 | 24.94 | 14 30 30.8 | 17.7 | 9.807 | 48.01 | 16 19.79 | 16 9.76 | 1 6.95 | 14 42 47.42 |
| 2 | 14 30 23.38 | 20.69 | 14 49 36.2 | 23.2 | 9.841 | 47.42 | 16 20.59 | 16 10.01 | 1 7.07 | 14 46 43.97 |
| 3 | 14 34 19.95 | 17.25 | 15 8 27.1 | 14.3 | 9.874 | 46.81 | 16 20.58 | 16 10.26 | 1 7.19 | 14 50 40.52 |
| 4 | 14 38 17.33 | 14.62 | 15 26 63.0 | 50.4 | 9.908 | 46.17 | 16 19.77 | 16 10.51 | 1 7.31 | 14 54 37.08 |
| 5 | 14 42 15.52 | 12.81 | -15 45 23.6 | 11.2 | 9.941 | -45.53 | -16 18.14 | 16 10.76 | 1 7.43 | 14 58 33.64 |
| 6 | 14 46 14.53 | 11.81 | 16 3 28.4 | 16.2 | 9.975 | 44.86 | 16 15.70 | 16 11.00 | 1 7.55 | 15 2 30.19 |
| 7 | 14 50 14.36 | 11.64 | 16 21 17.0 | 5.0 | 10.009 | 44.18 | 16 12.44 | 16 11.24 | 1 7.67 | 15 6 26.74 |
| 8 | 14 54 15.01 | 12.29 | 16 38 49.0 | 37.2 | 10.044 | 43.48 | 16 8.35 | 16 11.48 | 1 7.79 | 15 10 23.30 |
| 9 | 14 58 16.49 | 13.77 | 16 55 64.0 | 52.5 | 10.078 | 42.76 | 16 3.43 | 16 11.72 | 1 7.91 | 15 14 19.86 |
| 10 | 15 2 18.80 | 16.09 | -17 12 61.6 | 50.4 | 10.113 | -42.03 | -15 57.68 | 16 11.96 | 1 8.03 | 15 18 16.41 |
| 11 | 15 6 21.94 | 19.24 | 17 29 41.3 | 30.4 | 10.147 | 41.28 | 15 51.10 | 16 12.19 | 1 8.15 | 15 22 12.97 |
| 12 | 15 10 25.91 | 23.22 | 17 45 62.9 | 52.3 | 10.182 | 40.51 | 15 43.69 | 16 12.41 | 1 8.27 | 15 26 9.52 |
| 13 | 15 14 30.72 | 28.04 | 18 1 65.9 | 55.6 | 10.217 | 39.73 | 15 35.45 | 16 12.63 | 1 8.39 | 15 30 6.08 |
| 14 | 15 18 36.36 | 33.70 | 18 17 50.0 | 40.0 | 10.252 | 38.93 | 15 26.38 | 16 12.85 | 1 8.51 | 15 34 2.64 |
| 15 | 15 22 42.84 | 40.20 | -18 33 14.8 | 5.1 | 10.287 | -38.11 | -15 16.47 | 16 13.06 | 1 8.62 | 15 37 59.20 |
| 16 | 15 26 50.16 | 47.55 | -18 48 19.9 | 10.6 | 10.322 | -37.28 | -15 5.71 | 16 13.27 | 1 8.73 | 15 41 55.76 |

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0°.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

| Date. | Apparent Right Ascension. | | Apparent Declination. | | Hourly Motion. | | Equation of Time for Apparent Noon. | Semi-diameter at Apparent Noon. | Sidereal Time of Semid. Passing Merid. | Sidereal Time of Mean Noon. |
|---------|--|--------------|--|--------------|----------------|--------------|-------------------------------------|---------------------------------|--|--|
| | Mean Noon. | App. Noon. | Mean Noon. | App. Noon. | Right Ascen. | Declination. | | | | |
| | ^h ^m ^s | ^s | [°] ['] ["] | ["] | ^s | ["] | ^m ^s | ['] ["] | ^m ^s | ^h ^m ^s |
| Nov. 16 | 15 26 50.16 | 47.55 | 18 48 19.9 | 10.6 | 10.322 | -37.28 | 15 5.71 | 16 13.27 | 1 8.73 | 15 41 55.76 |
| 17 | 15 30 58.32 | 55.74 | 19 2 64.9 | 55.9 | 10.357 | 36.44 | 14 54.11 | 16 13.47 | 1 8.85 | 15 45 52.31 |
| 18 | 15 35 7.32 | 4.77 | 19 17 29.5 | 20.8 | 10.392 | 35.58 | 14 41.67 | 16 13.67 | 1 8.96 | 15 49 48.86 |
| 19 | 15 39 17.16 | 14.64 | 19 31 33.4 | 25.0 | 10.427 | 34.71 | 14 28.40 | 16 13.87 | 1 9.08 | 15 53 45.42 |
| 20 | 15 43 27.83 | 25.34 | 19 45 16.2 | 8.1 | 10.461 | 33.83 | 14 14.30 | 16 14.07 | 1 9.19 | 15 57 41.98 |
| 21 | 15 47 39.31 | 36.86 | 19 58 37.4 | 29.7 | 10.495 | -32.93 | 13 59.37 | 16 14.26 | 1 9.30 | 16 1 38.53 |
| 22 | 15 51 51.62 | 49.21 | 20 11 36.8 | 29.5 | 10.529 | 32.01 | 13 43.62 | 16 14.44 | 1 9.41 | 16 5 35.09 |
| 23 | 15 56 4.74 | 2.37 | 20 24 14.0 | 7.1 | 10.563 | 31.08 | 13 27.06 | 16 14.62 | 1 9.52 | 16 9 31.65 |
| 24 | 16 0 18.66 | 16.33 | 20 36 28.8 | 22.3 | 10.596 | 30.13 | 13 9.71 | 16 14.79 | 1 9.63 | 16 13 28.21 |
| 25 | 16 4 33.36 | 31.08 | 20 48 20.7 | 14.6 | 10.629 | 29.17 | 12 51.57 | 16 14.96 | 1 9.74 | 16 17 24.77 |
| 26 | 16 8 48.83 | 46.60 | 20 59 49.4 | 43.6 | 10.660 | -28.20 | 12 32.66 | 16 15.13 | 1 9.84 | 16 21 21.33 |
| 27 | 16 13 5.05 | 2.87 | 21 10 54.4 | 48.9 | 10.691 | 27.21 | 12 13.00 | 16 15.29 | 1 9.94 | 16 25 17.68 |
| 28 | 16 17 21.99 | 19.87 | 21 21 35.5 | 30.4 | 10.721 | 26.21 | 11 52.61 | 16 15.45 | 1 10.04 | 16 29 14.44 |
| 29 | 16 21 39.65 | 37.58 | 21 31 52.4 | 47.6 | 10.750 | 25.19 | 11 31.51 | 16 15.61 | 1 10.13 | 16 33 11.00 |
| 30 | 16 25 58.01 | 56.00 | 21 41 44.7 | 40.2 | 10.779 | 24.16 | 11 9.71 | 16 15.77 | 1 10.22 | 16 37 7.55 |
| Dec. 1 | 16 30 17.03 | 15.08 | 21 51 12.1 | 8.0 | 10.806 | -23.12 | 10 47.25 | 16 15.92 | 1 10.31 | 16 41 4.11 |
| 2 | 16 34 36.68 | 34.79 | 22 0 14.3 | 10.5 | 10.831 | 22.07 | 10 24.16 | 16 16.07 | 1 10.40 | 16 45 0.67 |
| 3 | 16 38 56.94 | 55.12 | 22 8 51.0 | 47.5 | 10.856 | 21.00 | 10 0.46 | 16 16.22 | 1 10.48 | 16 48 57.23 |
| 4 | 16 43 17.78 | 16.03 | 22 16 62.0 | 58.8 | 10.880 | 19.92 | 9 36.17 | 16 16.36 | 1 10.56 | 16 52 53.79 |
| 5 | 16 47 39.19 | 37.51 | 22 24 46.9 | 44.1 | 10.903 | 18.83 | 9 11.31 | 16 16.50 | 1 10.64 | 16 56 50.35 |
| 6 | 16 51 61.12 | 59.52 | 22 32 5.5 | 3.0 | 10.924 | -17.73 | 8 45.93 | 16 16.64 | 1 10.71 | 17 0 46.90 |
| 7 | 16 56 23.54 | 22.02 | 22 38 57.7 | 55.5 | 10.944 | 16.62 | 8 20.06 | 16 16.77 | 1 10.78 | 17 4 43.46 |
| 8 | 17 0 46.44 | 45.00 | 22 45 23.3 | 21.3 | 10.963 | 15.50 | 7 53.72 | 16 16.90 | 1 10.84 | 17 8 40.02 |
| 9 | 17 5 9.78 | 8.42 | 22 51 22.0 | 20.2 | 10.981 | 14.36 | 7 26.93 | 16 17.03 | 1 10.90 | 17 12 36.58 |
| 10 | 17 9 33.53 | 32.25 | 22 56 53.5 | 52.0 | 10.997 | 13.25 | 6 59.73 | 16 17.15 | 1 10.96 | 17 16 33.13 |
| 11 | 17 13 57.67 | 56.47 | 23 1 57.7 | 56.4 | 11.012 | -12.11 | 6 32.15 | 16 17.26 | 1 11.01 | 17 20 29.69 |
| 12 | 17 18 22.16 | 21.05 | 23 6 34.5 | 33.4 | 11.026 | 10.97 | 6 4.21 | 16 17.37 | 1 11.06 | 17 24 26.25 |
| 13 | 17 22 46.99 | 45.96 | 23 10 43.8 | 42.9 | 11.040 | 9.82 | 5 35.93 | 16 17.47 | 1 11.11 | 17 28 22.81 |
| 14 | 17 27 12.12 | 11.17 | 23 14 25.4 | 24.7 | 11.052 | 8.66 | 5 7.35 | 16 17.57 | 1 11.15 | 17 32 19.37 |
| 15 | 17 31 37.51 | 36.65 | 23 17 39.3 | 38.7 | 11.063 | 7.49 | 4 38.50 | 16 17.66 | 1 11.19 | 17 36 15.93 |
| 16 | 17 36 3.16 | 2.39 | 23 20 25.3 | 24.8 | 11.073 | -6.32 | 4 9.40 | 16 17.75 | 1 11.22 | 17 40 12.49 |
| 17 | 17 40 29.03 | 28.35 | 23 22 43.3 | 42.9 | 11.081 | 5.15 | 3 40.09 | 16 17.82 | 1 11.24 | 17 44 9.05 |
| 18 | 17 44 55.08 | 54.49 | 23 24 33.2 | 32.9 | 11.088 | 3.99 | 3 10.58 | 16 17.89 | 1 11.26 | 17 48 5.60 |
| 19 | 17 49 21.29 | 20.79 | 23 25 55.0 | 54.7 | 11.094 | 2.82 | 2 40.92 | 16 17.96 | 1 11.28 | 17 52 2.16 |
| 20 | 17 53 47.62 | 47.21 | 23 26 48.6 | 48.4 | 11.100 | 1.65 | 2 11.14 | 16 18.02 | 1 11.29 | 17 55 58.72 |
| 21 | 17 58 14.06 | 13.74 | 23 27 14.0 | 13.9 | 11.103 | -0.48 | 1 41.25 | 16 18.08 | 1 11.30 | 17 59 55.28 |
| 22 | 18 2 40.56 | 40.34 | 23 27 11.2 | 11.2 | 11.105 | +0.70 | 1 11.30 | 16 18.13 | 1 11.30 | 18 3 51.84 |
| 23 | 18 7 7.09 | 6.96 | 23 26 40.1 | 40.1 | 11.106 | 1.88 | 0 41.31 | 16 18.17 | 1 11.30 | 18 7 48.40 |
| 24 | 18 11 33.62 | 33.58 | 23 25 40.7 | 40.7 | 11.105 | 3.06 | 0 11.34 | 16 18.21 | 1 11.29 | 18 11 44.96 |
| 25 | 18 16 0.11 | 0.16 | 23 24 13.0 | 13.0 | 11.102 | 4.24 | 0 18.60 | 16 18.25 | 1 11.28 | 18 15 41.52 |
| 26 | 18 20 26.52 | 26.67 | 23 22 17.1 | 17.0 | 11.098 | +5.42 | 0 48.47 | 16 18.28 | 1 11.27 | 18 19 38.07 |
| 27 | 18 24 52.82 | 53.06 | 23 19 53.1 | 52.9 | 11.093 | 6.59 | 1 18.22 | 16 18.30 | 1 11.25 | 18 23 34.63 |
| 28 | 18 29 18.98 | 19.31 | 23 17 0.9 | 0.7 | 11.086 | 7.76 | 1 47.83 | 16 18.32 | 1 11.22 | 18 27 31.19 |
| 29 | 18 33 44.96 | 45.38 | 23 13 40.7 | 40.4 | 11.078 | 8.92 | 2 17.26 | 16 18.34 | 1 11.19 | 18 31 27.75 |
| 30 | 18 38 10.71 | 11.22 | 23 9 52.5 | 52.1 | 11.068 | 10.09 | 2 46.46 | 16 18.35 | 1 11.16 | 18 35 24.31 |
| 31 | 18 42 36.20 | 36.80 | 23 5 36.4 | 35.9 | 11.056 | +11.25 | 3 15.40 | 16 18.36 | 1 11.12 | 18 39 20.87 |
| 32 | 18 47 1.39 | 2.08 | 23 0 52.6 | 51.9 | 11.043 | +12.41 | 3 44.04 | 16 18.37 | 1 11.08 | 18 43 17.42 |

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

| Date. | Mean Time of Transit. | Diff. for 1 Hour of Long. | Right Ascension of Centre. | Diff. for 1 Hour of Long. | Geocentric Declination of Centre. | Diff. for 1 Hour of Long. | Sid. Time of Semid. Passing Meridian. | Geocentric Semi- diameter. | Equatorial Horizontal Parallax. | Bright Limbs. |
|--------|-----------------------------|------------------------------------|-------------------------------------|------------------------------------|--|------------------------------------|--|----------------------------------|---------------------------------------|------------------|
| | h m | m | h m s | s | ° ' " | " | s | ' " | ' " | |
| Jan. 1 | 17 24.13 | 1.693 | 12 11 13.99 | 111.73 | + 4 14 31.1 | -779.7 | 61.56 | 14 53.2 | 54 31.3 | II. S. |
| 2 | 18 4.95 | 1.716 | 12 56 6.54 | 113.13 | - 1 2 44.4 | -802.9 | 61.84 | 15 1.1 | 55 0.5 | II. S. |
| 3 | 18 46.91 | 1.789 | 13 42 7.47 | 117.47 | - 6 24 21.0 | -801.7 | 62.99 | 15 11.9 | 55 39.7 | II. S. |
| 4 | 19 31.21 | 1.912 | 14 30 29.33 | 124.88 | -11 38 53.8 | -786.1 | 65.15 | 15 25.1 | 56 28.3 | II. S. |
| 5 | 20 19.07 | 2.084 | 15 22 25.24 | 135.27 | -16 31 20.2 | -687.7 | 67.82 | 15 40.1 | 57 23.5 | II. S. |
| 6 | 21 11.51 | 2.291 | 16 18 57.01 | 147.50 | -20 41 33.7 | -552.2 | 70.90 | 15 55.8 | 58 21.2 | II. S. |
| 7 | 22 8.98 | 2.485 | 17 20 30.91 | 159.92 | -23 44 33.8 | -350.1 | 73.85 | 16 10.9 | 59 16.6 | II. S. |
| 8 | 23 10.77 | 2.635 | 18 26 25.36 | 168.63 | -25 14 0.0 | - 87.3 | 75.89 | 16 23.7 | 60 3.6 | II. N. |
| 10 | 0 14.83 | 2.675 | 19 34 35.88 | 170.79 | -24 50 35.9 | +206.2 | 76.39 | 16 32.7 | 60 36.7 | I. N. |
| 11 | 1 18.30 | 2.595 | 20 42 10.91 | 165.95 | -22 30 58.6 | 488.5 | 75.25 | 16 36.8 | 60 51.7 | I. S. |
| 12 | 2 18.79 | 2.439 | 21 46 46.70 | 156.60 | -18 30 10.3 | +706.5 | 73.04 | 16 35.6 | 60 47.5 | I. S. |
| 13 | 3 15.22 | 2.267 | 22 47 18.81 | 146.48 | -13 15 26.2 | 853.3 | 70.70 | 16 30.0 | 60 26.9 | I. S. |
| 14 | 4 7.82 | 2.125 | 23 43 59.63 | 137.63 | - 7 17 9.2 | 998.8 | 68.44 | 16 20.8 | 59 52.9 | I. S. |
| 15 | 4 57.57 | 2.028 | 0 37 47.00 | 131.89 | - 1 2 46.1 | 936.4 | 66.99 | 16 9.2 | 59 10.7 | I. S. |
| 16 | 5 45.59 | 1.985 | 1 29 55.04 | 129.32 | + 5 5 6.9 | 885.7 | 66.34 | 15 56.9 | 58 25.3 | I. S. |
| 17 | 6 33.21 | 1.990 | 2 21 36.53 | 129.59 | +10 48 12.0 | +813.0 | 66.42 | 15 44.6 | 57 39.9 | I. S. |
| 18 | 7 21.40 | 2.031 | 3 13 52.32 | 122.04 | 15 51 1.7 | 695.0 | 67.02 | 15 32.9 | 56 57.2 | I. S. |
| 19 | 8 10.83 | 2.091 | 4 7 23.16 | 125.64 | 19 59 58.1 | 544.5 | 67.91 | 15 22.5 | 56 18.9 | I. S. |
| 20 | 9 1.72 | 2.148 | 5 2 21.39 | 129.05 | 23 3 4.3 | 366.8 | 68.72 | 15 13.2 | 55 44.9 | I. S. |
| 21 | 9 53.70 | 2.177 | 5 58 25.37 | 140.86 | 24 51 5.7 | +171.0 | 69.11 | 15 5.3 | 55 15.7 | I. N. |
| 22 | 10 45.91 | 2.164 | 6 54 42.94 | 140.06 | +25 19 11.0 | - 29.7 | 68.84 | 14 58.5 | 54 51.0 | I. N. |
| 23 | 11 37.23 | 2.105 | 7 50 7.10 | 136.48 | 21 28 15.5 | -290.0 | 67.90 | 14 53.1 | 54 31.0 | I. N. |
| 24 | 12 26.67 | 2.012 | 8 43 38.44 | 130.88 | 22 24 55.0 | -390.3 | 66.42 | 14 48.8 | 54 15.1 | II. N. |
| 25 | 13 13.68 | 1.905 | 9 34 42.91 | 124.39 | 19 19 50.6 | -596.9 | 64.75 | 14 45.8 | 54 4.2 | II. S. |
| 26 | 13 58.17 | 1.806 | 10 23 16.25 | 118.47 | 15 25 31.9 | -636.8 | 63.18 | 14 44.4 | 53 58.9 | II. S. |
| 27 | 14 40.53 | 1.729 | 11 9 41.56 | 113.92 | +10 54 23.6 | -714.2 | 61.97 | 14 44.7 | 54 0.1 | II. S. |
| 28 | 15 21.44 | 1.686 | 11 54 39.14 | 111.27 | 5 57 48.4 | -764.6 | 61.23 | 14 47.1 | 54 8.8 | II. S. |
| 29 | 16 1.75 | 1.681 | 12 39 1.23 | 110.99 | + 0 46 2.9 | -790.4 | 61.26 | 14 51.7 | 54 25.8 | II. S. |
| 30 | 16 42.47 | 1.790 | 13 23 47.76 | 113.35 | - 4 31 10.3 | -791.8 | 62.00 | 14 58.9 | 54 52.3 | II. S. |
| 31 | 17 24.70 | 1.897 | 14 10 4.83 | 118.58 | - 9 43 39.1 | -765.1 | 63.48 | 15 8.7 | 55 28.6 | II. S. |
| Feb. 1 | 18 9.59 | 1.940 | 14 59 2.38 | 126.74 | -14 39 17.9 | -706.1 | 65.72 | 15 21.3 | 56 14.5 | II. S. |
| 2 | 18 58.29 | 2.120 | 15 51 48.49 | 137.55 | -19 2 34.4 | -601.8 | 68.53 | 15 36.0 | 57 8.5 | II. S. |
| 3 | 19 51.64 | 2.297 | 16 49 15.36 | 149.87 | -22 33 25.7 | -441.6 | 71.59 | 15 52.3 | 58 8.1 | II. S. |
| 4 | 20 49.86 | 2.517 | 17 51 34.13 | 161.29 | -24 47 56.4 | -219.5 | 74.33 | 16 8.8 | 59 9.0 | II. N. |
| 5 | 21 51.93 | 2.638 | 18 57 45.39 | 168.60 | -25 22 35.2 | + 54.1 | 76.01 | 16 24.1 | 60 5.3 | II. N. |
| 6 | 22 55.70 | 2.853 | 20 5 38.38 | 169.47 | -24 2 22.2 | +343.1 | 76.16 | 16 36.4 | 60 50.4 | II. N. |
| 7 | 23 58.50 | 2.765 | 21 12 33.35 | 164.16 | -20 48 32.9 | 613.5 | 74.86 | 16 43.9 | 61 17.9 | II. N. |
| 9 | 0 58.36 | 2.419 | 22 16 31.21 | 155.41 | -15 59 47.9 | 816.3 | 72.75 | 16 45.6 | 61 24.0 | I. N. |
| 10 | 1 54.56 | 2.969 | 23 16 49.48 | 146.39 | -10 5 54.7 | 938.2 | 70.56 | 16 41.3 | 61 8.3 | I. S. |
| 11 | 2 47.51 | 2.151 | 0 13 51.47 | 130.29 | - 3 39 24.9 | 981.4 | 68.83 | 16 31.9 | 60 33.9 | I. S. |
| 12 | 3 38.17 | 2.079 | 1 8 36.08 | 124.97 | + 2 50 13.9 | +956.8 | 67.79 | 16 18.8 | 59 45.8 | I. S. |
| 13 | 4 27.69 | 2.055 | 2 2 12.02 | 123.49 | 8 58 47.5 | 878.3 | 67.45 | 16 3.7 | 58 50.5 | I. S. |
| 14 | 5 17.11 | 2.071 | 2 55 41.77 | 124.33 | 14 27 10.8 | 757.5 | 67.72 | 15 48.3 | 57 53.6 | I. S. |
| 15 | 6 7.18 | 2.108 | 3 49 50.93 | 126.59 | 19 0 21.2 | 603.5 | 68.32 | 15 33.5 | 56 59.2 | I. S. |
| 16 | 6 58.25 | 2.148 | 4 45 0.15 | 129.10 | +22 26 33.9 | +423.9 | 68.91 | 15 19.9 | 56 9.5 | I. S. |

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

| Date. | Mean Time of Transit. | Diff. for 1 Hour of Long. | Right Ascension of Centre. | Diff. for 1 Hour of Long. | Geocentric Declination of Centre. | Diff. for 1 Hour of Long. | Sid. Time of Semid. Passing Meridian. | Geocentric Semi- diameter. | Equatorial Horizontal Parallax. | Bright Limbs. |
|---------|-----------------------------|------------------------------------|-------------------------------------|------------------------------------|--|------------------------------------|--|----------------------------------|---------------------------------------|------------------|
| | h m | m | h m s | s | ° ' " | " | s | ' " | ' " | |
| Feb. 16 | 6 58.25 | 2.148 | 4 45 0.15 | 139.10 | +22 26 33.9 | +423.9 | 68.91 | 15 19.9 | 56 9.5 | I. S. |
| 17 | 7 50.16 | 2.173 | 5 40 59.73 | 140.56 | 24 37 17.7 | 227.7 | 69.27 | 15 9.2 | 55 30.2 | I. S. |
| 18 | 8 42.27 | 2.162 | 6 37 11.26 | 139.95 | 25 28 4.9 | + 26.3 | 69.06 | 15 0.2 | 54 57.2 | I. N. |
| 19 | 9 33.65 | 2.112 | 7 32 39.02 | 136.93 | 24 59 17.0 | -167.9 | 68.22 | 14 53.5 | 54 32.0 | I. N. |
| 20 | 10 23.40 | 2.029 | 8 26 28.81 | 131.94 | 23 16 12.6 | -343.3 | 66.84 | 14 48.5 | 54 13.9 | I. N. |
| 21 | 11 10.92 | 1.930 | 9 18 4.41 | 125.96 | +20 28 5.8 | -499.1 | 65.20 | 14 45.3 | 54 2.3 | I. N. |
| 22 | 11 56.04 | 1.832 | 10 7 15.63 | 120.09 | 16 46 26.7 | -610.8 | 63.59 | 14 43.8 | 53 56.9 | I. N. |
| 23 | 12 39.00 | 1.752 | 10 54 16.62 | 115.23 | 12 23 25.6 | -699.3 | 62.26 | 14 43.8 | 53 56.8 | II. N. |
| 24 | 13 20.33 | 1.696 | 11 39 39.71 | 112.01 | 7 30 53.5 | -758.8 | 61.38 | 14 45.3 | 54 2.1 | II. S. |
| 25 | 14 0.76 | 1.677 | 12 24 9.16 | 110.78 | + 2 20 2.8 | -791.1 | 61.09 | 14 48.3 | 54 13.3 | II. S. |
| 26 | 14 41.18 | 1.696 | 13 8 37.06 | 111.91 | - 2 58 27.5 | -797.1 | 61.44 | 14 53.0 | 54 30.8 | II. S. |
| 27 | 15 22.52 | 1.756 | 13 54 0.80 | 115.51 | - 8 13 52.2 | -775.3 | 62.55 | 14 59.7 | 54 55.1 | II. S. |
| 28 | 16 5.80 | 1.858 | 14 41 21.50 | 121.65 | -13 14 30.2 | -729.4 | 64.31 | 15 8.4 | 55 27.2 | II. S. |
| Mar. 1 | 16 52.04 | 2.002 | 15 31 40.31 | 130.31 | -17 46 44.3 | -631.3 | 66.67 | 15 19.1 | 56 6.7 | II. S. |
| 2 | 17 42.13 | 2.176 | 16 25 49.96 | 140.76 | -21 33 59.3 | -495.8 | 69.10 | 15 32.0 | 56 53.8 | II. S. |
| 3 | 18 36.51 | 2.355 | 17 24 18.47 | 151.54 | -24 16 37.9 | -307.7 | 72.15 | 15 46.5 | 57 47.1 | II. S. |
| 4 | 19 34.90 | 2.501 | 18 26 47.83 | 160.31 | -25 33 42.4 | - 69.1 | 73.66 | 16 1.9 | 58 43.8 | II. N. |
| 5 | 20 35.98 | 2.573 | 19 31 59.56 | 164.65 | -25 7 41.5 | +303.6 | 75.24 | 16 17.1 | 59 39.6 | II. N. |
| 6 | 21 37.72 | 2.555 | 20 37 50.43 | 163.58 | -22 50 45.1 | 477.2 | 74.90 | 16 30.4 | 60 28.6 | II. N. |
| 7 | 22 38.09 | 2.466 | 21 42 19.09 | 158.25 | -18 50 2.4 | 717.0 | 73.59 | 16 40.3 | 61 4.6 | II. N. |
| 8 | 23 35.87 | 2.348 | 22 44 12.24 | 151.15 | -13 25 18.4 | +893.5 | 71.84 | 16 45.1 | 61 22.1 | II. N. |
| 10 | 0 30.88 | 2.241 | 23 43 18.39 | 144.82 | - 7 5 35.8 | 991.5 | 70.16 | 16 44.0 | 61 18.3 | I. N. |
| 11 | 1 23.69 | 2.168 | 0 40 12.24 | 140.27 | - 0 22 22.0 | 1011.3 | 69.07 | 16 37.2 | 60 53.0 | I. S. |
| 12 | 2 15.24 | 2.136 | 1 35 50.22 | 138.37 | + 6 14 9.5 | 960.7 | 68.63 | 16 25.5 | 60 9.5 | I. S. |
| 13 | 3 6.50 | 2.141 | 2 31 10.35 | 138.43 | 12 18 29.9 | 852.2 | 68.79 | 16 10.7 | 59 15.9 | I. S. |
| 14 | 3 58.20 | 2.170 | 3 26 57.78 | 140.45 | +17 29 47.8 | +697.8 | 69.31 | 15 54.3 | 58 15.8 | I. S. |
| 15 | 4 50.72 | 2.205 | 4 23 33.95 | 142.50 | 21 32 24.8 | 510.8 | 69.89 | 15 38.1 | 57 16.3 | I. S. |
| 16 | 5 43.90 | 2.222 | 5 20 50.29 | 143.56 | 24 15 53.6 | 304.5 | 70.22 | 15 23.4 | 56 20.1 | I. S. |
| 17 | 6 37.13 | 2.206 | 6 18 9.22 | 142.61 | 25 35 15.3 | + 92.7 | 69.99 | 15 10.8 | 55 33.9 | I. N. |
| 18 | 7 29.49 | 2.148 | 7 14 35.80 | 139.21 | 25 31 6.8 | -110.8 | 69.06 | 15 0.0 | 54 56.2 | I. N. |
| 19 | 8 20.09 | 2.064 | 8 9 16.59 | 133.02 | +24 9 9.1 | -294.8 | 67.62 | 14 52.3 | 54 28.2 | I. N. |
| 20 | 9 8.34 | 1.961 | 9 1 36.33 | 127.67 | 21 38 42.9 | -452.4 | 65.90 | 14 47.4 | 54 9.9 | I. N. |
| 21 | 9 54.09 | 1.856 | 9 51 25.38 | 121.56 | 18 11 4.6 | -580.7 | 64.08 | 14 44.8 | 54 0.3 | I. N. |
| 22 | 10 37.57 | 1.771 | 10 38 57.95 | 116.42 | 13 58 0.0 | -679.8 | 62.71 | 14 44.3 | 53 58.5 | I. N. |
| 23 | 11 19.31 | 1.712 | 11 24 45.70 | 112.88 | 9 10 59.3 | -750.7 | 61.93 | 14 45.7 | 54 3.3 | I. N. |
| 24 | 12 0.02 | 1.661 | 12 9 31.33 | 111.28 | + 4 1 8.2 | -794.1 | 61.28 | 14 48.5 | 54 14.0 | I. N. |
| 25 | 12 40.51 | 1.695 | 12 54 4.29 | 111.85 | - 1 20 36.5 | -810.0 | 61.38 | 14 52.7 | 54 29.6 | II. N. |
| 26 | 13 21.69 | 1.764 | 13 39 18.10 | 114.70 | - 6 42 57.2 | -796.7 | 62.21 | 14 58.2 | 54 49.8 | II. S. |
| 27 | 14 4.46 | 1.829 | 14 26 8.44 | 119.69 | -11 53 39.0 | -751.1 | 63.71 | 15 5.0 | 55 14.5 | II. S. |
| 28 | 14 49.76 | 1.951 | 15 15 30.03 | 127.27 | -16 38 50.1 | -668.2 | 65.76 | 15 12.9 | 55 43.7 | II. S. |
| 29 | 15 38.34 | 2.101 | 16 8 9.81 | 136.29 | -20 42 32.9 | -542.6 | 68.20 | 15 22.1 | 56 17.6 | II. S. |
| 30 | 16 30.68 | 2.259 | 17 4 34.65 | 145.76 | -23 46 47.8 | -370.2 | 70.69 | 15 32.6 | 56 56.0 | II. S. |
| 31 | 17 26.58 | 2.393 | 18 4 34.96 | 153.84 | -25 32 55.8 | -152.8 | 72.74 | 15 44.2 | 57 38.7 | II. N. |
| Apr. 1 | 18 25.12 | 2.472 | 19 7 13.21 | 158.56 | -25 44 52.1 | + 95.1 | 73.92 | 15 56.6 | 58 24.0 | II. N. |
| 2 | 19 24.67 | 2.476 | 20 10 52.29 | 158.84 | -24 13 34.4 | +358.3 | 73.96 | 16 8.9 | 59 9.5 | II. N. |

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

| Date. | Mean Time of Transit. | Diff. for 1 Hour of Long. | Right Ascension of Centre. | Diff. for 1 Hour of Long. | Geocentric Declination of Centre. | Diff. for 1 Hour of Long. | Sid. Time of Semid. Passing Meridian. | Geocentric Semi-diameter. | Equatorial Horizontal Parallax. | Bright Limbs. |
|--------|-----------------------|---------------------------|----------------------------|---------------------------|-----------------------------------|---------------------------|---------------------------------------|---------------------------|---------------------------------|---------------|
| | h m | m | h m s | s | ° ' " | " | ° | ' " | ' " | |
| Apr. 2 | 19 24.67 | 2.476 | 20 10 52.29 | 158.84 | -24 13 34.4 | +356.3 | 73.96 | 16 8.9 | 59 9.5 | II. N. |
| 3 | 20 23.50 | 2.417 | 21 13 48.48 | 155.97 | -21 0 34.7 | 600.9 | 73.04 | 16 20.4 | 59 51.7 | II. N. |
| 4 | 21 20.42 | 2.325 | 22 14 50.01 | 149.73 | -16 18 26.9 | 800.7 | 71.59 | 16 29.5 | 60 25.2 | II. N. |
| 5 | 22 15.10 | 2.235 | 23 13 35.78 | 144.31 | -10 28 1.8 | 938.9 | 70.20 | 16 35.2 | 60 46.2 | II. N. |
| 6 | 23 7.90 | 2.172 | 0 10 29.37 | 140.56 | - 3 56 24.3 | 1007.8 | 69.18 | 16 36.3 | 60 50.3 | II. N. |
| 7 | 23 59.67 | 2.140 | 1 6 20.49 | 139.16 | + 2 48 54.6 | +1006.3 | 68.80 | 16 32.5 | 60 36.3 | II. N. |
| 9 | 0 51.35 | 2.165 | 2 2 6.67 | 140.08 | 9 19 33.6 | 935.9 | 69.06 | 16 24.0 | 60 3.9 | I. N. |
| 10 | 1 43.78 | 2.207 | 2 58 37.07 | 142.67 | 15 9 39.1 | 805.1 | 69.77 | 16 11.6 | 59 19.2 | I. S. |
| 11 | 2 37.38 | 2.259 | 3 56 18.55 | 145.75 | 19 57 12.7 | 695.6 | 70.60 | 15 56.8 | 58 25.2 | I. S. |
| 12 | 3 32.06 | 2.292 | 4 55 4.81 | 147.78 | 23 25 47.6 | 413.3 | 71.19 | 15 41.2 | 57 28.0 | I. S. |
| 13 | 4 27.11 | 2.286 | 5 54 13.73 | 147.41 | +25 25 58.0 | +187.0 | 71.18 | 15 26.3 | 56 32.9 | I. S. |
| 14 | 5 21.44 | 2.231 | 6 52 38.72 | 144.09 | 25 56 2.9 | - 33.9 | 70.38 | 15 12.9 | 55 43.6 | I. N. |
| 15 | 6 13.90 | 2.135 | 7 49 11.82 | 138.29 | 25 1 25.5 | -234.3 | 68.91 | 15 2.0 | 55 3.7 | I. N. |
| 16 | 7 3.73 | 2.016 | 8 43 6.25 | 131.15 | 22 52 23.0 | -405.2 | 67.02 | 14 53.9 | 54 33.8 | I. N. |
| 17 | 7 50.67 | 1.897 | 9 34 7.02 | 124.04 | 19 41 26.1 | -544.1 | 65.11 | 14 48.7 | 54 14.8 | I. N. |
| 18 | 8 34.96 | 1.798 | 10 22 28.38 | 118.01 | +15 41 8.2 | -652.5 | 63.39 | 14 46.3 | 54 6.0 | I. N. |
| 19 | 9 17.18 | 1.726 | 11 8 45.00 | 117.89 | 11 3 8.9 | -733.1 | 62.12 | 14 46.5 | 54 6.9 | I. N. |
| 20 | 9 58.10 | 1.690 | 11 53 43.47 | 111.87 | 5 58 12.1 | -787.5 | 61.44 | 14 49.1 | 54 16.2 | I. N. |
| 21 | 10 38.60 | 1.693 | 12 38 16.71 | 111.64 | + 0 36 38.0 | -816.0 | 61.41 | 14 53.5 | 54 32.5 | I. N. |
| 22 | 11 19.62 | 1.733 | 13 23 20.91 | 114.12 | - 4 50 48.3 | -816.3 | 62.08 | 14 59.4 | 54 54.1 | I. N. |
| 23 | 12 2.10 | 1.815 | 14 9 53.61 | 119.01 | -10 12 3.8 | -784.2 | 63.42 | 15 6.4 | 55 19.8 | I. II. N. S. |
| 24 | 12 47.00 | 1.933 | 14 58 50.71 | 126.19 | -15 13 2.3 | -713.8 | 65.36 | 15 14.1 | 55 48.3 | II. S. |
| 25 | 13 35.07 | 2.078 | 15 50 59.94 | 134.90 | -19 37 10.8 | -599.0 | 67.72 | 15 22.3 | 56 18.3 | II. S. |
| 26 | 14 26.80 | 2.229 | 16 46 48.93 | 144.16 | -23 5 44.2 | -435.2 | 70.15 | 15 30.8 | 56 49.5 | II. S. |
| 27 | 15 22.04 | 2.364 | 17 46 8.94 | 151.87 | -25 19 24.7 | -225.4 | 72.22 | 15 39.5 | 57 21.3 | II. S. |
| 28 | 16 19.85 | 2.440 | 18 48 3.27 | 156.45 | -26 1 46.8 | + 18.1 | 73.41 | 15 48.2 | 57 53.3 | II. N. |
| 29 | 17 18.61 | 2.449 | 19 50 55.00 | 156.62 | -25 3 32.6 | 273.5 | 73.49 | 15 56.9 | 58 25.1 | II. N. |
| 30 | 18 16.58 | 2.379 | 20 52 59.36 | 152.99 | -22 25 35.8 | 513.4 | 72.66 | 16 5.1 | 58 55.4 | II. N. |
| May 1 | 19 12.54 | 2.279 | 21 53 2.61 | 147.13 | -18 18 43.4 | 715.8 | 71.08 | 16 12.5 | 59 22.5 | II. N. |
| 2 | 20 6.10 | 2.185 | 22 50 41.80 | 141.35 | -13 0 44.7 | 865.7 | 69.57 | 16 18.4 | 59 44.4 | II. N. |
| 3 | 20 57.65 | 2.117 | 23 46 19.89 | 137.24 | - 6 53 31.9 | +960.9 | 68.46 | 16 22.1 | 59 58.0 | II. N. |
| 4 | 21 48.05 | 2.091 | 0 40 48.70 | 135.65 | - 0 20 35.9 | 994.0 | 68.00 | 16 22.9 | 60 0.8 | II. N. |
| 5 | 22 38.35 | 2.106 | 1 35 11.73 | 136.74 | + 6 13 25.7 | 965.5 | 68.16 | 16 20.2 | 59 51.2 | II. N. |
| 6 | 23 29.54 | 2.165 | 2 30 29.38 | 140.08 | 12 23 37.7 | 875.1 | 69.06 | 16 13.9 | 59 27.8 | II. N. |
| 8 | 0 22.40 | 2.241 | 3 27 24.70 | 147.14 | 17 45 52.5 | 796.6 | 70.22 | 16 4.4 | 58 52.9 | II. S. |
| 9 | 1 17.04 | 2.309 | 4 26 8.90 | 148.81 | +21 58 40.8 | +530.1 | 71.30 | 15 52.5 | 58 9.2 | II. S. |
| 10 | 2 12.97 | 2.342 | 5 26 10.44 | 150.74 | 24 46 0.0 | 309.9 | 71.85 | 15 39.3 | 57 20.6 | II. S. |
| 11 | 3 9.00 | 2.315 | 6 26 17.99 | 149.16 | 25 59 56.4 | + 67.7 | 71.53 | 15 26.0 | 56 31.8 | II. S. |
| 12 | 4 3.66 | 2.233 | 7 25 3.13 | 144.01 | 25 41 55.2 | -153.2 | 70.30 | 15 13.7 | 55 46.4 | II. N. |
| 13 | 4 55.85 | 2.105 | 8 21 12.33 | 136.49 | 24 1 10.3 | -344.1 | 68.42 | 15 3.2 | 55 8.1 | II. N. |
| 14 | 5 44.60 | 1.965 | 9 14 8.92 | 128.28 | +21 11 18.8 | -496.8 | 66.40 | 14 55.3 | 54 39.0 | II. N. |
| 15 | 6 30.31 | 1.845 | 10 3 55.61 | 120.87 | 17 26 45.9 | -618.3 | 64.30 | 14 50.2 | 54 20.3 | II. N. |
| 16 | 7 13.39 | 1.752 | 10 51 4.30 | 115.29 | 13 0 43.3 | -707.3 | 62.72 | 14 48.2 | 54 12.6 | II. N. |
| 17 | 7 54.67 | 1.691 | 11 36 24.01 | 111.83 | 8 4 29.9 | -789.9 | 61.72 | 14 49.0 | 54 15.7 | II. N. |
| 18 | 8 35.08 | 1.690 | 12 20 52.10 | 112.67 | + 2 48 8.7 | -808.0 | 61.40 | 14 52.5 | 54 28.7 | II. N. |

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

| Date. | Mean Time of Transit. | Diff. for 1 Hour of Long. | Right Ascension of Centre. | Diff. for 1 Hour of Long. | Geocentric Declination of Centre. | Diff. for 1 Hour of Long. | Sid. Time of Semid. Passing Meridian. | Geocentric Semi- diameter. | Equatorial Horizontal Parallax. | Bright Limbs. |
|--------|-----------------------------|------------------------------------|-------------------------------------|------------------------------------|--|------------------------------------|--|----------------------------------|---------------------------------------|------------------|
| | h m | m | h m s | s | ° ' " | " | s | ' " | ' " | |
| May 18 | 8 35.08 | 1.680 | 12 20 52.10 | 110.94 | + 2 48 8.7 | -808.0 | 61.40 | 14 52.5 | 54 28.7 | I. N. |
| 19 | 9 15.66 | 1.709 | 13 53 10.10 | 112.67 | - 2 38 32.5 | -821.4 | 61.83 | 14 58.4 | 54 50.3 | I. N. |
| 20 | 9 57.46 | 1.784 | 13 51 21.46 | 117.06 | - 8 5 5.5 | -805.9 | 63.00 | 15 6.2 | 55 18.8 | I. N. |
| 21 | 10 41.53 | 1.898 | 14 39 29.30 | 194.03 | -13 18 28.6 | -754.5 | 64.85 | 15 15.2 | 55 51.9 | I. N. |
| 22 | 11 28.82 | 2.051 | 15 30 51.12 | 133.13 | -18 2 47.2 | -658.8 | 67.24 | 15 24.8 | 56 27.5 | I. N. |
| 23 | 12 20.00 | 2.218 | 16 26 7.05 | 143.26 | -21 58 39.6 | -511.0 | 69.85 | 15 34.5 | 57 2.9 | II. S. |
| 24 | 13 15.14 | 2.372 | 17 25 21.11 | 152.54 | -24 44 41.5 | -309.8 | 72.20 | 15 43.6 | 57 36.3 | II. S. |
| 25 | 14 13.41 | 2.470 | 18 27 43.07 | 158.46 | -26 1 5.1 | - 66.0 | 73.70 | 15 51.6 | 58 5.9 | II. S. |
| 26 | 15 13.06 | 2.484 | 19 31 28.91 | 159.33 | -25 35 9.9 | +196.1 | 73.98 | 15 58.4 | 58 30.9 | II. N. |
| 27 | 16 12.04 | 2.418 | 20 34 33.90 | 155.98 | -23 25 49.7 | 445.3 | 73.05 | 16 3.9 | 58 50.9 | II. N. |
| 28 | 17 8.74 | 2.303 | 21 35 21.31 | 148.34 | -19 43 47.4 | +656.1 | 71.38 | 16 7.9 | 59 5.8 | II. N. |
| 29 | 18 2.50 | 2.181 | 22 33 12.40 | 141.08 | -14 47 43.8 | 814.5 | 69.55 | 16 10.6 | 59 15.6 | II. N. |
| 30 | 18 53.61 | 2.085 | 23 28 23.88 | 135.33 | - 8 59 34.9 | 916.8 | 68.06 | 16 11.9 | 59 20.3 | II. N. |
| 31 | 19 42.94 | 2.034 | 0 21 48.56 | 132.99 | - 2 41 36.7 | 964.0 | 67.23 | 16 11.6 | 59 19.4 | II. N. |
| June 1 | 20 31.65 | 2.033 | 1 14 35.48 | 132.91 | + 3 44 25.9 | 957.3 | 67.15 | 16 9.6 | 59 12.0 | II. N. |
| 2 | 21 20.80 | 2.078 | 2 7 55.10 | 134.91 | + 9 57 0.2 | +896.5 | 67.81 | 16 5.7 | 58 57.6 | II. N. |
| 3 | 22 11.68 | 2.158 | 3 2 47.12 | 139.71 | 15 34 27.5 | 781.5 | 68.99 | 15 59.7 | 58 35.6 | II. N. |
| 4 | 23 4.58 | 2.250 | 3 59 46.44 | 145.23 | 20 15 31.7 | 615.2 | 70.36 | 15 51.7 | 58 6.4 | II. N. |
| 5 | 23 59.53 | 2.322 | 4 58 48.79 | 149.57 | 23 41 13.2 | 406.9 | 71.44 | 15 42.2 | 57 31.3 | I. S. |
| 7 | 0 55.65 | 2.343 | 5 59 2.04 | 150.81 | 25 37 59.4 | +174.6 | 71.77 | 15 31.6 | 56 52.4 | I. S. |
| 8 | 1 51.47 | 2.296 | 6 58 56.86 | 147.95 | +26 0 52.6 | - 57.8 | 71.11 | 15 20.7 | 56 12.7 | I. S. |
| 9 | 2 45.40 | 2.189 | 7 56 57.86 | 141.58 | 24 54 30.4 | -268.2 | 69.56 | 15 10.5 | 55 34.7 | I. N. |
| 10 | 2 36.31 | 2.051 | 8 51 57.61 | 133.95 | 22 30 54.3 | -442.7 | 67.47 | 15 1.5 | 55 1.9 | I. N. |
| 11 | 4 23.83 | 1.911 | 9 43 33.00 | 124.85 | 19 5 24.1 | -578.1 | 65.30 | 14 54.6 | 54 36.5 | I. N. |
| 12 | 5 8.22 | 1.794 | 10 32 0.62 | 117.78 | 14 53 7.2 | -677.8 | 63.26 | 14 50.1 | 54 20.1 | I. N. |
| 13 | 5 50.21 | 1.712 | 11 18 3.32 | 112.85 | +10 7 12.3 | -747.4 | 62.06 | 14 48.5 | 54 14.1 | I. N. |
| 14 | 6 30.73 | 1.672 | 12 2 37.61 | 110.46 | + 4 58 37.3 | -791.8 | 61.36 | 14 49.7 | 54 18.7 | I. N. |
| 15 | 7 10.83 | 1.678 | 12 46 46.86 | 110.79 | - 0 23 3.8 | -813.0 | 61.45 | 14 54.2 | 54 34.9 | I. N. |
| 16 | 7 51.63 | 1.730 | 13 31 38.09 | 113.96 | - 5 48 26.9 | -809.7 | 62.30 | 15 1.2 | 55 0.7 | I. N. |
| 17 | 8 34.27 | 1.889 | 14 18 20.05 | 120.04 | -11 6 46.4 | -776.5 | 63.92 | 15 10.6 | 55 35.1 | I. N. |
| 18 | 9 19.88 | 1.978 | 15 8 0.84 | 126.83 | -16 4 28.9 | -704.7 | 66.23 | 15 21.7 | 56 15.9 | I. N. |
| 19 | 10 9.44 | 2.157 | 16 1 38.66 | 139.62 | -20 24 0.7 | -583.5 | 68.88 | 15 33.8 | 57 0.1 | I. N. |
| 20 | 11 3.44 | 2.349 | 16 59 44.53 | 150.77 | -23 43 47.4 | -404.5 | 71.76 | 15 45.8 | 57 44.4 | I. N. |
| 21 | 12 1.55 | 2.490 | 18 1 57.35 | 159.61 | -25 40 42.5 | -170.5 | 73.90 | 15 56.8 | 58 25.0 | I. II. S. |
| 22 | 13 2.29 | 2.553 | 19 6 47.82 | 163.44 | -25 55 48.3 | + 98.8 | 74.85 | 16 5.9 | 58 58.5 | II. S. |
| 23 | 14 3.33 | 2.515 | 20 11 56.80 | 161.90 | -24 21 21.1 | +369.5 | 74.40 | 16 13.1 | 59 22.5 | II. N. |
| 24 | 15 2.44 | 2.401 | 21 15 10.05 | 154.32 | -21 4 23.1 | 605.9 | 72.72 | 16 16.1 | 59 35.9 | II. N. |
| 25 | 15 58.35 | 2.258 | 22 15 10.22 | 145.65 | -16 23 57.9 | 784.8 | 70.64 | 16 17.0 | 59 39.0 | II. N. |
| 26 | 16 50.92 | 2.130 | 23 11 49.70 | 137.98 | -10 44 47.6 | 900.1 | 68.73 | 16 15.4 | 59 33.2 | II. N. |
| 27 | 17 40.88 | 2.043 | 0 5 51.87 | 132.75 | - 4 31 53.0 | 954.9 | 67.39 | 16 11.9 | 59 20.4 | II. N. |
| 28 | 18 29.36 | 2.007 | 0 58 25.49 | 130.62 | + 1 51 48.8 | +955.1 | 66.83 | 16 6.9 | 59 2.1 | II. N. |
| 29 | 19 17.62 | 2.094 | 1 50 45.90 | 131.60 | 8 5 29.1 | 905.9 | 67.06 | 16 0.8 | 58 39.7 | II. N. |
| 30 | 20 6.83 | 2.083 | 2 44 2.43 | 135.18 | 13 49 37.5 | 807.5 | 67.95 | 15 53.9 | 58 14.7 | II. N. |
| July 1 | 20 57.81 | 2.169 | 3 39 6.56 | 140.35 | +18 45 22.2 | +663.4 | 69.22 | 15 46.3 | 57 46.7 | II. N. |

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

| Date. | Mean Time of Transit. | Diff. for 1 Hour of Long. | Right Ascension of Centre. | Diff. for 1 Hour of Long. | Geocentric Declination of Centre. | Diff. for 1 Hour of Long. | Std. Time of Semid. Passing Meridian. | Geocentric Semi-diameter. | Equatorial Horizontal Parallax. | Bright Limbs. |
|--------|-----------------------|---------------------------|----------------------------|---------------------------|-----------------------------------|---------------------------|---------------------------------------|---------------------------|---------------------------------|---------------|
| | h m | m | h m s | s | ° ' " | " | s | ' " | ' " | |
| July 1 | 20 57.81 | 2.169 | 3 39 6.55 | 140.60 | +18 45 22.2 | +663.4 | 69.23 | 15 46.4 | 57 46.7 | II. N. |
| 2 | 21 50.93 | 2.235 | 4 36 18.61 | 145.43 | 22 34 53.3 | 477.3 | 70.46 | 15 38.0 | 57 16.7 | II. N. |
| 3 | 22 45.78 | 2.307 | 5 35 15.52 | 148.72 | 25 3 15.6 | 280.4 | 71.23 | 15 29.6 | 56 45.1 | II. N. S. |
| 4 | 23 41.25 | 2.309 | 6 34 49.49 | 148.41 | 26 1 31.1 | + 30.7 | 71.13 | 15 20.8 | 56 12.8 | II. S. |
| 6 | 0 35.79 | 2.239 | 7 33 27.33 | 144.13 | 25 29 9.6 | -188.9 | 70.06 | 15 12.1 | 55 40.8 | I. S. |
| 7 | 1 27.99 | 2.113 | 8 29 44.21 | 136.93 | +23 34 11.2 | -379.9 | 68.26 | 15 4.1 | 55 11.1 | I. N. S. |
| 8 | 2 17.02 | 1.974 | 9 22 50.95 | 128.60 | 20 30 19.5 | -589.8 | 66.14 | 14 57.2 | 54 45.3 | I. N. |
| 9 | 3 2.79 | 1.844 | 10 12 41.18 | 120.80 | 16 33 15.9 | -646.4 | 64.09 | 14 51.6 | 54 25.2 | I. N. |
| 10 | 3 45.75 | 1.742 | 10 59 42.36 | 114.65 | 11 57 48.1 | -725.5 | 62.23 | 14 48.2 | 54 12.8 | I. N. |
| 11 | 4 26.70 | 1.677 | 11 44 42.57 | 110.79 | 6 56 35.0 | -776.0 | 61.42 | 14 47.2 | 54 9.3 | I. N. |
| 12 | 5 6.62 | 1.660 | 12 28 40.64 | 109.50 | + 1 40 13.8 | -801.8 | 61.09 | 14 49.0 | 54 15.8 | I. N. |
| 13 | 5 46.57 | 1.681 | 13 12 41.13 | 111.00 | - 3 41 50.5 | -804.6 | 61.54 | 14 53.6 | 54 33.0 | I. N. |
| 14 | 6 27.70 | 1.751 | 13 57 52.37 | 115.42 | - 9 0 6.5 | -789.3 | 62.78 | 15 1.2 | 55 0.9 | I. N. |
| 15 | 7 11.18 | 1.877 | 14 45 24.85 | 122.77 | -14 3 28.0 | -738.8 | 64.78 | 15 11.5 | 55 38.6 | I. N. |
| 16 | 7 58.15 | 2.044 | 15 36 26.96 | 132.80 | -18 37 38.7 | -634.4 | 67.41 | 15 24.1 | 56 24.8 | I. N. |
| 17 | 8 49.50 | 2.238 | 16 31 53.13 | 144.54 | -22 24 3.9 | -488.1 | 70.37 | 15 38.2 | 57 16.6 | I. N. |
| 18 | 9 45.55 | 2.427 | 17 32 1.83 | 155.89 | -25 0 14.4 | -289.8 | 73.12 | 15 52.7 | 58 9.9 | I. N. S. |
| 19 | 10 45.56 | 2.558 | 18 36 8.64 | 163.33 | -26 3 12.0 | - 24.7 | 74.97 | 16 6.4 | 59 0.4 | I. N. S. |
| 20 | 11 47.60 | 2.591 | 19 42 17.90 | 165.80 | -25 16 32.4 | +259.3 | 75.42 | 16 18.0 | 59 42.7 | I. S. |
| 21 | 12 49.15 | 2.522 | 20 47 57.67 | 161.80 | -22 37 47.8 | 598.5 | 74.42 | 16 26.1 | 60 12.7 | II. S. |
| 22 | 13 48.15 | 2.388 | 21 51 3.81 | 153.86 | -18 20 33.3 | +746.8 | 72.50 | 16 30.1 | 60 26.9 | II. N. |
| 23 | 14 43.70 | 2.244 | 22 50 42.64 | 144.89 | -12 49 43.3 | 885.0 | 70.38 | 16 29.5 | 60 25.4 | II. N. |
| 24 | 15 36.05 | 2.197 | 23 47 8.89 | 137.78 | - 6 34 12.9 | 971.0 | 68.68 | 16 25.3 | 60 9.5 | II. N. |
| 25 | 16 26.15 | 2.057 | 0 41 19.24 | 133.61 | - 0 1 38.8 | 981.8 | 67.61 | 16 17.9 | 59 42.6 | II. N. |
| 26 | 17 15.19 | 2.039 | 1 34 26.76 | 132.48 | + 6 23 45.8 | 936.6 | 67.37 | 16 8.6 | 59 8.4 | II. N. |
| 27 | 18 4.40 | 2.068 | 2 27 43.67 | 134.24 | +12 21 8.3 | +842.6 | 67.85 | 15 58.4 | 58 30.6 | II. N. |
| 28 | 18 54.74 | 2.131 | 3 22 8.95 | 138.07 | 17 32 4.7 | 705.3 | 68.80 | 15 47.8 | 57 51.6 | II. N. |
| 29 | 19 46.78 | 2.205 | 4 18 16.54 | 142.54 | 21 40 8.5 | 589.3 | 69.90 | 15 37.4 | 57 13.7 | II. N. |
| 30 | 20 40.48 | 2.264 | 5 16 3.82 | 146.06 | 24 31 26.6 | 323.1 | 70.73 | 15 27.6 | 56 37.9 | II. N. |
| 31 | 21 35.10 | 2.277 | 6 14 46.38 | 146.92 | 25 56 28.9 | +100.8 | 70.91 | 15 19.0 | 56 4.7 | II. N. S. |
| Aug. 1 | 22 29.36 | 2.233 | 7 13 7.93 | 144.94 | +25 52 21.7 | -119.2 | 70.16 | 15 10.4 | 55 34.5 | II. S. |
| 2 | 23 21.90 | 2.138 | 8 9 46.18 | 138.49 | 24 23 44.9 | -318.8 | 68.61 | 15 3.1 | 55 7.4 | II. S. |
| 4 | 0 11.75 | 2.013 | 9 3 41.18 | 131.01 | 21 41 43.9 | -484.8 | 66.69 | 14 56.7 | 54 43.9 | II. S. |
| 5 | 0 58.49 | 1.884 | 9 54 29.89 | 123.30 | 18 0 47.4 | -613.3 | 64.62 | 14 51.3 | 54 24.5 | I. N. S. |
| 6 | 1 42.33 | 1.774 | 10 42 24.08 | 116.56 | 13 35 58.2 | -705.0 | 62.84 | 14 47.5 | 54 10.5 | I. N. |
| 7 | 2 23.88 | 1.664 | 11 27 59.99 | 111.78 | + 8 41 4.3 | -764.5 | 61.56 | 14 45.4 | 54 2.4 | I. N. |
| 8 | 3 3.95 | 1.652 | 12 12 7.82 | 109.98 | + 3 28 3.8 | -796.9 | 60.91 | 14 45.2 | 54 1.8 | I. N. |
| 9 | 3 43.53 | 1.653 | 12 55 45.39 | 109.29 | - 1 52 37.0 | -808.2 | 60.99 | 14 47.4 | 54 9.7 | I. N. |
| 10 | 4 23.64 | 1.697 | 13 39 55.10 | 111.98 | - 7 11 15.8 | -785.9 | 61.80 | 14 52.1 | 54 27.1 | I. N. |
| 11 | 5 5.37 | 1.788 | 14 25 42.60 | 117.45 | -12 17 45.0 | -741.7 | 63.38 | 14 59.5 | 54 54.6 | I. N. |
| 12 | 5 49.84 | 1.925 | 15 14 14.58 | 125.66 | -17 0 9.4 | -664.3 | 65.64 | 15 9.8 | 55 32.2 | I. N. |
| 13 | 6 38.07 | 2.093 | 16 6 32.50 | 136.15 | -21 3 27.9 | -544.5 | 68.40 | 15 22.6 | 56 19.3 | I. N. |
| 14 | 7 30.74 | 2.290 | 17 3 18.19 | 147.68 | -24 8 48.9 | -373.0 | 71.30 | 15 37.5 | 57 13.9 | I. N. |
| 15 | 8 27.85 | 2.458 | 18 4 30.90 | 157.91 | -25 54 32.8 | -146.7 | 73.43 | 15 53.5 | 58 12.9 | I. N. S. |
| 16 | 9 28.34 | 2.568 | 19 9 6.24 | 164.10 | -26 0 23.6 | +129.9 | 75.18 | 16 9.4 | 59 11.5 | I. S. |

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

| Date. | Mean Time of Transit. | Diff. for 1 Hour of Long. | Right Ascension of Centre. | Diff. for 1 Hour of Long. | Geocentric Declination of Centre. | Diff. for 1 Hour of Long. | Sid. Time of Semid. Passing Meridian. | Geocentric Semi-diameter. | Equatorial Horizontal Parallax. | Bright Limbs. |
|---------|-----------------------|---------------------------|----------------------------|---------------------------|-----------------------------------|---------------------------|---------------------------------------|---------------------------|---------------------------------|---------------|
| | h m | m | h m s | s | ° ' " | " | s | ' " | ' " | I. S. |
| Aug. 17 | 10 30.13 | 2 567 | 20 15 0.80 | 164.42 | -24 14 28.1 | +405.7 | 75.20 | 16 23.6 | 60 3.7 | I. S. |
| 18 | 11 30.94 | 2 488 | 21 19 56.56 | 159.54 | -20 39 17.7 | 669.3 | 73.99 | 16 34.5 | 60 43.5 | I. S. |
| 19 | 12 29.20 | 2 364 | 22 22 17.67 | 152.05 | -15 32 27.0 | 859.8 | 72.16 | 16 40.5 | 61 5.8 | II. S. |
| 20 | 13 24.42 | 2 242 | 23 21 36.35 | 144.74 | - 9 21 36.5 | 981.1 | 70.37 | 16 41.3 | 61 8.1 | II. N. |
| 21 | 14 17.09 | 2 155 | 0 18 21.87 | 139.49 | - 2 37 57.3 | 1094.6 | 69.09 | 16 36.6 | 60 50.8 | II. N. |
| 22 | 15 8.22 | 2 114 | 1 13 34.34 | 137.04 | + 4 8 38.6 | +997.5 | 68.52 | 16 27.6 | 60 17.3 | II. N. |
| 23 | 15 58.93 | 2 119 | 2 8 21.99 | 137.35 | 10 31 59.6 | 910.1 | 68.66 | 16 15.3 | 59 32.9 | II. N. |
| 24 | 16 50.23 | 2 160 | 3 3 44.74 | 139.81 | 16 10 1.9 | 772.6 | 69.33 | 16 1.5 | 58 42.4 | II. N. |
| 25 | 17 42.75 | 2 217 | 4 0 21.07 | 143.25 | 20 44 39.0 | 594.6 | 70.23 | 15 47.5 | 57 50.9 | II. N. |
| 26 | 18 36.58 | 2 264 | 4 58 16.72 | 146.15 | 24 1 44.5 | 386.9 | 70.96 | 15 34.2 | 57 1.9 | II. N. |
| 27 | 19 31.20 | 2 277 | 5 56 59.06 | 143.91 | +25 52 4.6 | +163.4 | 71.11 | 15 22.2 | 56 17.8 | II. N. S. |
| 28 | 20 25.52 | 2 239 | 6 55 23.86 | 144.61 | 26 12 38.5 | - 58.9 | 70.47 | 15 11.8 | 55 39.4 | II. S. |
| 29 | 21 18.32 | 2 153 | 7 52 16.94 | 130.39 | 25 7 13.7 | -263.9 | 69.08 | 15 3.2 | 55 7.7 | II. S. |
| 30 | 22 8.61 | 2 035 | 8 46 39.41 | 132.30 | 22 45 30.3 | -439.0 | 67.16 | 14 56.1 | 54 41.9 | II. S. |
| 31 | 22 55.94 | 1 911 | 9 38 3.80 | 124.78 | 19 20 42.7 | -578.8 | 65.11 | 14 50.7 | 54 22.2 | II. S. |
| Sept. 1 | 23 40.40 | 1 798 | 10 26 34.92 | 118.03 | +15 7 14.2 | -692.8 | 63.25 | 14 46.8 | 54 7.7 | II. S. |
| 3 | 0 22.46 | 1 713 | 11 12 41.85 | 112.85 | 10 18 55.0 | -753.6 | 61.81 | 14 44.5 | 53 58.9 | I. S. |
| 4 | 1 2.85 | 1 660 | 11 57 8.34 | 109.72 | + 5 8 18.8 | -794.7 | 60.97 | 14 43.5 | 53 55.6 | I. N. |
| 5 | 1 42.42 | 1 644 | 12 40 46.02 | 108.78 | - 0 13 14.6 | -808.7 | 60.73 | 14 44.3 | 53 58.4 | I. N. |
| 6 | 2 22.12 | 1 671 | 13 24 30.91 | 110.54 | - 5 35 13.7 | -796.9 | 61.21 | 14 46.7 | 54 8.0 | I. N. |
| 7 | 3 2.91 | 1 737 | 14 9 21.62 | 114.52 | -10 47 9.4 | -758.1 | 62.42 | 14 51.5 | 54 25.2 | I. N. |
| 8 | 3 45.79 | 1 844 | 14 56 17.89 | 120.73 | -15 37 40.2 | -689.0 | 64.28 | 14 58.4 | 54 50.4 | I. N. |
| 9 | 4 31.70 | 1 988 | 15 46 16.55 | 129.45 | -19 53 32.4 | -583.8 | 66.68 | 15 7.9 | 55 25.3 | I. N. |
| 10 | 5 21.39 | 2 155 | 16 40 2.75 | 139.55 | -23 18 55.3 | -435.4 | 69.35 | 15 19.7 | 56 8.8 | I. N. |
| 11 | 6 15.15 | 2 321 | 17 37 54.02 | 149.54 | -25 35 29.3 | -239.4 | 71.88 | 15 33.7 | 57 0.4 | I. N. |
| 12 | 7 12.52 | 2 449 | 18 39 22.17 | 157.22 | -26 24 28.6 | + 1.0 | 73.95 | 15 49.4 | 57 57.9 | I. S. |
| 13 | 8 12.15 | 2 505 | 19 43 6.25 | 160.61 | -25 31 2.6 | 968.7 | 74.52 | 16 5.7 | 58 57.7 | I. S. |
| 14 | 9 12.16 | 2 482 | 20 47 13.23 | 159.22 | -22 49 43.4 | 534.7 | 74.11 | 16 21.2 | 59 54.8 | I. S. |
| 15 | 10 10.86 | 2 401 | 21 50 1.33 | 154.41 | -18 27 46.2 | 766.7 | 72.89 | 16 34.4 | 60 42.8 | I. S. |
| 16 | 11 7.35 | 2 306 | 22 50 36.70 | 148.58 | -12 44 22.6 | 938.6 | 71.40 | 16 43.2 | 61 15.2 | I. S. |
| 17 | 12 1.67 | 2 227 | 23 49 1.09 | 143.78 | - 6 6 54.7 | +1035.6 | 70.17 | 16 46.4 | 61 27.4 | II. S. |
| 18 | 12 54.50 | 2 184 | 0 45 56.31 | 141.25 | + 0 53 35.6 | 1053.8 | 69.55 | 16 43.8 | 61 17.7 | II. N. |
| 19 | 13 46.85 | 2 185 | 1 42 22.22 | 141.32 | 7 46 6.1 | 996.8 | 69.61 | 16 35.6 | 60 47.5 | II. N. |
| 20 | 14 39.68 | 2 222 | 2 39 17.21 | 143.54 | 14 2 10.6 | 873.5 | 70.25 | 16 23.1 | 60 1.5 | II. N. |
| 21 | 15 33.66 | 2 277 | 3 37 21.54 | 146.87 | 19 17 41.4 | 696.3 | 71.32 | 16 7.9 | 59 5.8 | II. N. |
| 22 | 16 28.92 | 2 324 | 4 36 43.08 | 149.57 | +23 14 2.2 | +480.5 | 71.92 | 15 51.8 | 58 6.5 | II. N. |
| 23 | 17 24.94 | 2 375 | 5 36 49.61 | 150.36 | 25 39 24.6 | 944.7 | 72.12 | 15 36.1 | 57 8.9 | II. N. |
| 24 | 18 20.59 | 2 292 | 6 36 34.82 | 147.83 | 26 29 51.0 | + 9.2 | 71.49 | 15 21.9 | 56 16.7 | II. N. S. |
| 25 | 19 14.60 | 2 200 | 7 34 40.86 | 142.22 | 25 49 18.4 | -207.5 | 70.04 | 15 9.8 | 55 32.4 | II. S. |
| 26 | 20 5.94 | 2 074 | 8 30 5.81 | 134.66 | 23 47 58.5 | -383.3 | 68.04 | 15 0.1 | 54 56.7 | II. S. |
| 27 | 20 54.11 | 1 942 | 9 22 20.94 | 126.65 | +20 39 29.6 | -543.0 | 65.85 | 14 52.8 | 54 29.8 | II. S. |
| 28 | 21 39.22 | 1 822 | 10 11 31.33 | 119.43 | 16 38 20.0 | -657.0 | 63.82 | 14 47.8 | 54 11.2 | II. S. |
| 29 | 22 21.75 | 1 729 | 10 58 6.81 | 113.82 | 11 58 11.4 | -736.5 | 62.20 | 14 44.8 | 54 0.1 | II. S. |
| 30 | 23 2.45 | 1 669 | 11 42 51.51 | 110.25 | 6 51 28.3 | -790.3 | 61.14 | 14 43.5 | 53 55.8 | II. S. |
| Oct. 1 | 23 42.15 | 1 646 | 12 26 36.57 | 108.88 | + 1 29 33.0 | -814.7 | 60.73 | 14 43.9 | 53 57.3 | II. S. |

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

| Date. | Mean Time of Transit. | Diff. for 1 Hour of Long. | Right Ascension of Centre. | Diff. for 1 Hour of Long. | Geocentric Declination of Centre. | Diff. for 1 Hour of Long. | Sid. Time of Semid. Passing Meridian. | Geocentric Semi- diameter. | Equatorial Horizontal Parallax. | Bright Limbs. |
|--------|-----------------------------|------------------------------------|-------------------------------------|------------------------------------|--|------------------------------------|--|----------------------------------|---------------------------------------|------------------|
| | h m | m | h m s | s | ° ' " | " | s | " | " | |
| Oct. 1 | 23 42.15 | 1.640 | 12 26 36.57 | 108.88 | + 1 20 33.0 | -814.7 | 60.73 | 14 43.9 | 53 57.3 | II. S. |
| 3 | 0 21.75 | 1.661 | 13 10 16.16 | 109.81 | - 3 56 45.2 | -812.9 | 61.00 | 14 45.8 | 54 4.5 | I. N. S. |
| 4 | 1 2.19 | 1.715 | 13 54 45.67 | 113.04 | - 9 16 28.3 | -781.5 | 61.96 | 14 49.3 | 54 17.0 | I. N. |
| 5 | 1 44.38 | 1.806 | 14 41 0.16 | 118.53 | -14 17 50.8 | -720.3 | 63.55 | 14 54.3 | 54 35.1 | I. N. |
| 6 | 2 29.16 | 1.931 | 15 29 51.08 | 126.01 | -18 47 40.2 | -623.0 | 65.65 | 15 0.8 | 54 58.9 | I. N. |
| 7 | 3 17.22 | 2.077 | 16 21 59.20 | 134.81 | -22 30 54.7 | -496.9 | 68.06 | 15 9.1 | 55 29.4 | I. N. |
| 8 | 4 8.86 | 2.294 | 17 17 42.86 | 143.71 | -25 10 56.5 | -306.8 | 70.42 | 15 19.2 | 56 6.8 | I. N. |
| 9 | 5 3.79 | 2.344 | 18 16 43.81 | 150.94 | -26 31 3.3 | - 87.8 | 72.28 | 15 31.1 | 56 50.5 | I. N. S. |
| 10 | 6 0.97 | 2.409 | 19 18 0.98 | 154.89 | -26 17 27.3 | +159.3 | 73.26 | 15 44.6 | 57 39.9 | I. S. |
| 11 | 6 58.91 | 2.407 | 20 20 3.10 | 154.70 | -24 23 3.0 | 419.9 | 73.21 | 15 59.0 | 58 32.7 | I. S. |
| 12 | 7 56.11 | 2.353 | 21 21 21.24 | 151.42 | -20 50 5.8 | +447.5 | 72.34 | 16 13.3 | 59 25.5 | I. S. |
| 13 | 8 51.67 | 2.278 | 22 21 0.50 | 146.81 | -15 50 24.1 | 843.7 | 71.13 | 16 26.3 | 60 13.1 | I. S. |
| 14 | 9 45.46 | 2.210 | 23 18 53.44 | 142.84 | - 9 43 30.4 | 981.3 | 70.07 | 16 36.4 | 60 50.2 | I. S. |
| 15 | 10 38.03 | 2.177 | 0 15 32.67 | 140.83 | - 2 54 29.2 | 1051.9 | 69.51 | 16 42.0 | 61 11.1 | I. S. |
| 16 | 11 30.31 | 2.186 | 1 11 54.33 | 141.41 | + 4 8 5.0 | 1048.3 | 69.62 | 16 42.3 | 61 12.3 | I. S. |
| 17 | 12 23.32 | 2.235 | 2 9 0.28 | 144.44 | +10 54 1.2 | +908.9 | 70.41 | 16 37.1 | 60 52.8 | II. N. S. |
| 18 | 13 17.89 | 2.313 | 3 7 40.01 | 140.09 | 16 53 47.2 | 818.8 | 71.60 | 16 26.8 | 60 14.8 | II. N. |
| 19 | 14 14.33 | 2.389 | 4 8 12.06 | 153.46 | 21 41 17.6 | 610.5 | 72.75 | 16 12.6 | 59 23.2 | II. N. |
| 20 | 15 12.17 | 2.424 | 5 10 8.54 | 155.70 | 24 57 8.4 | 304.8 | 73.39 | 15 56.7 | 58 24.6 | II. N. |
| 21 | 16 10.17 | 2.398 | 6 12 14.78 | 154.11 | 26 31 37.5 | +108.4 | 73.06 | 15 40.3 | 57 24.3 | II. N. S. |
| 22 | 17 6.70 | 2.304 | 7 12 52.68 | 148.44 | +26 25 59.4 | -131.9 | 71.70 | 15 25.0 | 56 28.0 | II. S. |
| 23 | 18 0.36 | 2.164 | 8 10 37.79 | 140.02 | 24 50 38.2 | -338.1 | 69.57 | 15 11.6 | 55 39.1 | II. S. |
| 24 | 18 50.43 | 2.008 | 9 4 46.24 | 130.71 | 22 1 1.5 | -503.9 | 67.13 | 15 0.9 | 54 59.5 | II. S. |
| 25 | 19 36.89 | 1.867 | 9 55 18.16 | 122.19 | 18 13 36.2 | -697.9 | 64.80 | 14 52.9 | 54 30.3 | II. S. |
| 26 | 20 20.28 | 1.755 | 10 42 45.65 | 115.45 | 13 43 19.3 | -717.9 | 62.85 | 14 47.4 | 54 11.3 | II. S. |
| 27 | 21 1.44 | 1.681 | 11 27 58.11 | 110.98 | + 8 42 59.5 | -778.9 | 61.54 | 14 45.2 | 54 1.9 | II. S. |
| 28 | 21 41.29 | 1.646 | 12 11 52.18 | 108.93 | + 3 23 42.8 | -813.9 | 60.89 | 14 45.0 | 54 1.2 | II. S. |
| 29 | 22 20.81 | 1.652 | 12 55 26.61 | 109.34 | - 2 4 12.0 | -821.9 | 60.95 | 14 46.8 | 54 7.6 | II. S. |
| 30 | 23 0.98 | 1.701 | 13 39 40.11 | 112.17 | - 7 30 14.0 | -803.4 | 61.72 | 14 50.2 | 54 20.2 | II. S. |
| 31 | 23 42.76 | 1.786 | 14 25 29.97 | 117.34 | -12 42 47.3 | -753.8 | 63.15 | 14 54.9 | 54 37.6 | II. N. S. |
| Nov. 2 | 0 27.01 | 1.906 | 15 13 49.01 | 124.54 | -17 28 25.8 | -667.9 | 65.13 | 15 0.8 | 54 59.3 | I. N. S. |
| 3 | 1 14.44 | 2.049 | 16 5 18.91 | 133.09 | -21 31 39.0 | -540.9 | 67.45 | 15 7.7 | 55 24.5 | I. N. |
| 4 | 2 5.35 | 2.192 | 17 0 18.39 | 141.75 | -24 35 17.1 | -370.0 | 69.74 | 15 15.3 | 55 52.9 | I. N. |
| 5 | 2 59.44 | 2.308 | 17 58 29.54 | 148.77 | -26 22 19.0 | -159.9 | 71.59 | 15 23.9 | 56 24.6 | I. N. |
| 6 | 3 55.71 | 2.369 | 18 58 51.35 | 152.30 | -26 38 58.5 | + 78.9 | 72.57 | 15 33.5 | 56 59.5 | I. N. S. |
| 7 | 4 52.62 | 2.369 | 19 59 52.22 | 152.01 | -25 18 18.0 | +323.7 | 72.53 | 15 43.8 | 57 37.1 | I. S. |
| 8 | 5 48.68 | 2.302 | 21 0 1.68 | 148.39 | -22 22 9.9 | 559.6 | 71.65 | 15 54.5 | 58 16.6 | I. S. |
| 9 | 6 42.95 | 2.219 | 21 58 22.87 | 143.34 | -18 0 40.5 | 748.0 | 70.37 | 16 5.4 | 58 56.7 | I. S. |
| 10 | 7 35.25 | 2.143 | 22 54 46.21 | 138.85 | -12 29 50.4 | 897.9 | 69.19 | 16 15.6 | 59 33.9 | I. S. |
| 11 | 8 26.12 | 2.102 | 23 49 43.47 | 136.32 | - 6 9 26.5 | 994.7 | 68.48 | 16 24.0 | 60 5.0 | I. S. |
| 12 | 9 16.53 | 2.106 | 0 44 12.95 | 136.59 | + 0 37 57.9 | +1031.9 | 68.49 | 16 29.7 | 60 25.7 | I. S. |
| 13 | 10 7.64 | 2.159 | 1 39 24.16 | 139.80 | 7 27 14.5 | 1003.0 | 69.25 | 16 31.5 | 60 32.5 | I. S. |
| 14 | 11 0.52 | 2.252 | 2 36 22.75 | 145.41 | 13 50 53.7 | 903.3 | 70.65 | 16 29.0 | 60 23.0 | I. S. |
| 15 | 11 55.93 | 2.364 | 3 35 52.32 | 152.09 | 19 20 34.7 | 733.8 | 72.30 | 16 21.8 | 59 56.9 | II. N. S. |
| 16 | 12 53.83 | 2.456 | 4 37 52.71 | 157.41 | +23 30 7.7 | + 505.6 | 73.67 | 16 10.9 | 59 16.8 | II. N. |

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

| Date. | Mean Time of Transit. | Diff. for 1 Hour of Long. | Right Ascension of Centre. | Diff. for 1 Hour of Long. | Geocentric Declination of Centre. | Diff. for 1 Hour of Long. | Sid. Time of Semid. Passing Meridian. | Geocentric Semidiameter. | Equatorial Horizontal Parallax. | Bright Limbs. |
|---------|-----------------------|---------------------------|----------------------------|---------------------------|-----------------------------------|---------------------------|---------------------------------------|--------------------------|---------------------------------|---------------|
| | h m | m | h m s | s | ° ' " | " | s | ' " | ' " | |
| Nov. 16 | 12 53.83 | 2.456 | 4 37 52.71 | 157.41 | +23 30 7.7 | +505.6 | 73.67 | 16 10.9 | 59 16.8 | II. N. |
| 17 | 13 53.25 | 2.483 | 5 41 24.18 | 159.33 | 26 0 25.1 | +242.7 | 73.81 | 15 57.3 | 58 26.6 | II. N. |
| 18 | 14 52.35 | 2.427 | 6 44 36.45 | 155.95 | 26 44 1.6 | - 22.0 | 73.39 | 15 42.4 | 57 31.9 | II. N. S. |
| 19 | 15 49.13 | 2.292 | 7 45 29.33 | 147.95 | 25 46 33.8 | -258.5 | 71.49 | 15 27.0 | 56 37.8 | II. S. |
| 20 | 16 42.21 | 2.125 | 8 42 39.29 | 137.72 | 23 23 16.5 | -449.8 | 68.95 | 15 14.3 | 55 49.0 | II. S. |
| 21 | 17 31.15 | 1.956 | 9 35 40.01 | 127.52 | +19 53 9.3 | -692.9 | 66.34 | 15 3.2 | 55 8.2 | II. S. |
| 22 | 18 16.30 | 1.813 | 10 24 53.37 | 118.95 | 15 34 14.8 | -695.0 | 63.98 | 14 54.9 | 54 37.4 | II. S. |
| 23 | 18 58.51 | 1.712 | 11 11 9.38 | 112.82 | 10 41 15.6 | -785.2 | 62.24 | 14 49.5 | 54 17.5 | II. S. |
| 24 | 19 38.81 | 1.655 | 11 55 30.22 | 109.37 | 5 26 15.0 | -803.6 | 61.21 | 14 47.1 | 54 8.7 | II. S. |
| 25 | 20 18.28 | 1.643 | 12 39 1.47 | 106.70 | + 0 1 20.9 | -819.8 | 60.95 | 14 47.5 | 54 10.3 | II. S. |
| 26 | 20 58.01 | 1.677 | 13 22 48.83 | 110.72 | - 5 26 34.4 | -814.3 | 61.46 | 14 50.4 | 54 21.0 | II. S. |
| 27 | 21 39.09 | 1.754 | 14 7 56.75 | 115.37 | -10 46 11.6 | -779.2 | 62.71 | 14 55.4 | 54 39.5 | II. S. |
| 28 | 22 22.52 | 1.872 | 14 55 26.45 | 122.46 | -15 45 13.3 | -710.1 | 64.62 | 15 2.2 | 55 3.9 | II. S. |
| 29 | 23 9.18 | 2.000 | 15 46 10.04 | 131.40 | -20 8 33.4 | -599.2 | 66.96 | 15 9.8 | 55 32.4 | II. S. |
| 30 | 23 59.58 | 2.179 | 16 40 38.63 | 140.25 | -23 38 20.2 | -441.5 | 69.43 | 15 18.1 | 56 3.1 | I. N. |
| Dec. 2 | 0 53.59 | 2.315 | 17 38 45.38 | 149.20 | -25 55 29.3 | -237.0 | 71.53 | 15 26.6 | 56 34.4 | I. N. |
| 3 | 1 50.29 | 2.393 | 18 39 32.46 | 153.98 | -26 43 19.0 | + 2.1 | 72.77 | 15 35.0 | 57 4.9 | I. N. |
| 4 | 2 47.95 | 2.396 | 19 41 18.38 | 153.82 | -25 52 14.1 | 252.4 | 72.85 | 15 42.9 | 57 34.0 | I. N. S. |
| 5 | 3 44.75 | 2.326 | 20 42 12.29 | 149.90 | -23 23 0.6 | 488.5 | 71.90 | 15 50.4 | 58 1.4 | I. S. |
| 6 | 4 39.39 | 2.223 | 21 40 56.04 | 143.58 | -19 26 16.5 | 687.8 | 70.36 | 15 57.2 | 58 26.7 | I. S. |
| 7 | 5 31.46 | 2.120 | 22 37 5.71 | 137.45 | -14 19 2.7 | +840.0 | 68.82 | 16 3.5 | 58 49.5 | I. S. |
| 8 | 6 21.43 | 2.051 | 23 31 8.35 | 133.15 | - 8 21 3.7 | 941.4 | 67.70 | 16 8.9 | 59 9.4 | I. S. |
| 9 | 7 10.17 | 2.023 | 0 23 57.29 | 131.36 | - 1 52 51.1 | 991.0 | 67.28 | 16 13.2 | 59 25.2 | I. S. |
| 10 | 7 58.98 | 2.052 | 1 16 50.82 | 133.12 | + 4 44 31.5 | 986.6 | 67.70 | 16 15.9 | 59 34.9 | I. S. |
| 11 | 8 49.12 | 2.122 | 2 11 3.67 | 138.15 | 11 8 41.4 | 924.0 | 68.88 | 16 16.3 | 59 36.6 | I. S. |
| 12 | 9 41.65 | 2.250 | 3 7 40.92 | 145.20 | +16 55 26.1 | +799.0 | 70.61 | 16 14.1 | 59 28.4 | I. S. |
| 13 | 10 37.17 | 2.375 | 4 7 17.59 | 152.75 | 21 39 29.7 | 611.3 | 72.44 | 16 8.8 | 59 9.1 | I. S. |
| 14 | 11 35.37 | 2.465 | 5 9 36.00 | 158.19 | 24 57 34.4 | 372.0 | 73.76 | 16 0.8 | 58 39.7 | I. N. |
| 15 | 12 34.90 | 2.479 | 6 13 13.75 | 159.00 | 26 33 34.6 | +103.8 | 73.96 | 15 50.4 | 58 1.4 | II. N. |
| 16 | 13 33.62 | 2.400 | 7 16 3.43 | 154.23 | 26 22 7.5 | -151.9 | 72.83 | 15 38.5 | 57 17.5 | II. N. S. |
| 17 | 14 29.51 | 2.250 | 8 16 2.64 | 145.20 | +24 36 53.1 | -368.5 | 70.66 | 15 26.2 | 56 32.1 | II. S. |
| 18 | 15 21.37 | 2.072 | 9 11 59.38 | 134.48 | 21 31 16.3 | -545.5 | 67.96 | 15 14.2 | 55 48.8 | II. S. |
| 19 | 16 9.03 | 1.905 | 10 3 42.99 | 124.42 | 17 27 10.7 | -667.3 | 65.37 | 15 4.0 | 55 11.2 | II. S. |
| 20 | 16 53.05 | 1.771 | 10 51 48.06 | 116.42 | 12 42 57.3 | -747.6 | 63.21 | 14 56.0 | 54 41.7 | II. S. |
| 21 | 17 34.40 | 1.683 | 11 37 12.73 | 111.15 | 7 33 24.7 | -795.0 | 61.75 | 14 60.7 | 54 22.1 | II. S. |
| 22 | 18 14.21 | 1.643 | 12 21 4.23 | 108.67 | + 2 10 8.5 | -817.1 | 61.06 | 14 48.5 | 54 13.6 | II. S. |
| 23 | 18 53.62 | 1.650 | 13 4 32.06 | 109.13 | - 3 17 13.3 | -815.9 | 61.15 | 14 49.1 | 54 16.2 | II. S. |
| 24 | 19 33.80 | 1.705 | 13 48 45.73 | 112.48 | - 8 39 27.9 | -791.0 | 62.08 | 14 52.7 | 54 29.6 | II. S. |
| 25 | 20 15.88 | 1.808 | 14 34 53.78 | 118.64 | -13 46 15.5 | -737.6 | 63.75 | 14 59.1 | 54 52.9 | II. S. |
| 26 | 21 0.92 | 1.951 | 15 24 0.43 | 127.28 | -18 24 45.1 | -648.0 | 66.02 | 15 7.6 | 55 24.1 | II. S. |
| 27 | 21 49.78 | 2.122 | 16 16 56.42 | 137.50 | -22 18 36.9 | -513.1 | 68.65 | 15 17.7 | 56 1.3 | II. S. |
| 28 | 22 42.78 | 2.291 | 17 14 2.16 | 147.73 | -25 8 23.1 | -327.1 | 71.18 | 15 28.4 | 56 41.3 | II. N. S. |
| 29 | 23 39.43 | 2.416 | 18 14 46.61 | 155.29 | -26 34 2.3 | - 87.5 | 73.03 | 15 39.3 | 57 20.8 | II. N. |
| 31 | 0 38.19 | 2.464 | 19 17 38.83 | 158.10 | -26 20 14.0 | +204.9 | 73.71 | 15 49.2 | 57 57.1 | I. N. |
| 32 | 1 36.97 | 2.410 | 20 20 31.39 | 155.25 | -24 22 1.3 | +546.0 | 73.10 | 15 57.5 | 58 27.8 | I. N. S. |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi-diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi-diam. | S.T. of Sem. Pass. Mer. |
|--------|-----------------------|-----------------------------------|----------------------------------|-----------|------------|-------------------------|---------|-----------------------|-----------------------------------|----------------------------------|-----------|------------|-------------------------|
| | h m | h m s | ° ' " | " | " | s | | h m | h m s | ° ' " | " | " | s |
| Jan. 0 | 1 25.1 | 20 5 38.05 | -20 54 52.1 | 9.7 | 3.7 | 0.26 | Feb. 14 | 22 38.7 | 20 20 13.48 | -20 18 46.1 | 7.8 | 3.0 | 0.31 |
| 1 | 1 23.4 | 20 7 50.05 | 20 33 19.5 | 10.0 | 3.8 | 0.27 | 15 | 22 40.5 | 20 25 50.35 | 20 7 39.5 | 7.8 | 2.9 | 0.21 |
| 2 | 1 21.0 | 20 9 22.64 | 20 12 33.6 | 10.4 | 3.9 | 0.28 | 16 | 22 42.2 | 20 31 31.75 | 19 55 17.0 | 7.7 | 2.9 | 0.21 |
| 3 | 1 18.0 | 20 10 12.64 | 19 52 53.7 | 10.8 | 4.1 | 0.29 | 17 | 22 44.0 | 20 37 17.32 | 19 41 37.8 | 7.6 | 2.9 | 0.20 |
| 4 | 1 14.1 | 20 10 17.24 | 19 34 38.4 | 11.1 | 4.1 | 0.29 | 18 | 22 45.9 | 20 43 6.74 | 19 26 41.5 | 7.5 | 2.8 | 0.20 |
| 5 | 1 9.4 | 20 9 34.31 | -19 18 5.6 | 11.4 | 4.3 | 0.30 | 19 | 22 47.8 | 20 48 59.71 | -19 10 27.9 | 7.4 | 2.8 | 0.20 |
| 6 | 1 4.1 | 20 8 2.81 | 19 3 31.0 | 11.7 | 4.4 | 0.31 | 20 | 22 49.8 | 20 54 55.97 | 18 52 56.8 | 7.4 | 2.8 | 0.20 |
| 7 | 0 57.7 | 20 5 42.90 | 18 51 7.4 | 12.0 | 4.5 | 0.31 | 21 | 22 51.8 | 21 0 55.28 | 18 34 8.0 | 7.3 | 2.8 | 0.20 |
| 8 | 0 50.6 | 20 2 36.39 | 18 41 3.5 | 12.3 | 4.6 | 0.32 | 22 | 22 53.9 | 21 6 57.44 | 18 14 1.2 | 7.2 | 2.7 | 0.19 |
| 9 | 0 42.9 | 19 58 46.89 | 18 33 23.2 | 12.5 | 4.7 | 0.33 | 23 | 22 56.1 | 21 13 2.29 | 17 52 36.0 | 7.1 | 2.7 | 0.19 |
| 10 | 0 34.6 | 19 54 19.86 | -18 28 6.0 | 12.8 | 4.8 | 0.33 | 24 | 22 58.3 | 21 19 9.66 | -17 29 52.6 | 7.1 | 2.7 | 0.19 |
| 11 | 0 25.7 | 19 49 22.54 | 18 25 6.8 | 13.0 | 4.9 | 0.34 | 25 | 23 0.5 | 21 25 19.42 | 17 5 50.7 | 7.0 | 2.7 | 0.19 |
| 12 | 0 16.4 | 19 44 3.61 | 18 24 16.5 | 13.2 | 5.0 | 0.34 | 26 | 23 2.7 | 21 31 31.45 | 16 40 30.4 | 7.0 | 2.7 | 0.19 |
| 13 | 0 7.0 | 19 38 32.77 | 18 25 23.8 | 13.3 | 5.0 | 0.34 | 27 | 23 5.0 | 21 37 45.66 | 16 13 51.8 | 7.0 | 2.6 | 0.19 |
| 13 | 23 57.5 | 19 33 0.07 | 18 28 15.2 | 13.3 | 5.1 | 0.34 | 28 | 23 7.3 | 21 44 1.97 | 15 45 54.7 | 6.9 | 2.6 | 0.18 |
| 14 | 23 48.3 | 19 27 35.31 | -18 32 36.9 | 13.2 | 5.0 | 0.35 | Mar. 1 | 23 9.7 | 21 50 20.32 | -15 16 39.4 | 6.9 | 2.6 | 0.18 |
| 15 | 23 39.2 | 19 22 27.42 | 18 38 15.5 | 13.2 | 5.0 | 0.35 | 2 | 23 12.1 | 21 56 40.65 | 14 46 5.7 | 6.9 | 2.6 | 0.18 |
| 16 | 23 30.5 | 19 17 43.93 | 18 44 58.6 | 13.1 | 4.9 | 0.35 | 3 | 23 14.5 | 22 3 2.95 | 14 14 13.8 | 6.8 | 2.6 | 0.18 |
| 17 | 23 22.3 | 19 13 30.78 | 18 52 34.3 | 13.0 | 4.8 | 0.34 | 4 | 23 16.9 | 22 9 27.20 | 13 41 3.9 | 6.8 | 2.6 | 0.18 |
| 18 | 23 14.8 | 19 9 52.32 | 19 0 52.2 | 12.8 | 4.8 | 0.34 | 5 | 23 19.4 | 22 15 53.42 | 13 6 36.2 | 6.7 | 2.5 | 0.17 |
| 19 | 23 7.9 | 19 6 51.25 | -19 9 42.4 | 12.6 | 4.7 | 0.33 | 6 | 23 21.9 | 22 22 21.61 | -12 30 50.9 | 6.7 | 2.5 | 0.17 |
| 20 | 23 1.5 | 19 4 28.80 | 19 18 55.7 | 12.3 | 4.6 | 0.33 | 7 | 23 24.6 | 22 28 51.79 | 11 53 48.3 | 6.7 | 2.5 | 0.17 |
| 21 | 22 55.8 | 19 2 45.11 | 19 28 23.5 | 12.1 | 4.6 | 0.32 | 8 | 23 27.2 | 22 35 24.02 | 11 15 28.7 | 6.7 | 2.5 | 0.17 |
| 22 | 22 50.9 | 19 1 39.40 | 19 37 57.6 | 11.8 | 4.5 | 0.32 | 9 | 23 29.8 | 22 41 58.33 | 10 35 52.6 | 6.6 | 2.5 | 0.17 |
| 23 | 22 46.5 | 19 1 10.23 | 19 47 30.5 | 11.6 | 4.4 | 0.31 | 10 | 23 32.4 | 22 48 34.80 | 9 55 0.6 | 6.6 | 2.5 | 0.17 |
| 24 | 22 42.6 | 19 1 15.67 | -19 56 54.6 | 11.3 | 4.3 | 0.30 | 11 | 23 35.1 | 22 55 13.50 | -9 12 53.3 | 6.6 | 2.5 | 0.17 |
| 25 | 22 39.3 | 19 1 53.62 | 20 6 2.8 | 11.0 | 4.2 | 0.29 | 12 | 23 37.8 | 23 1 54.51 | 8 29 31.3 | 6.6 | 2.5 | 0.17 |
| 26 | 22 36.4 | 19 3 1.82 | 20 14 48.9 | 10.8 | 4.1 | 0.29 | 13 | 23 40.6 | 23 8 37.90 | 7 44 55.5 | 6.5 | 2.5 | 0.17 |
| 27 | 22 34.1 | 19 4 37.93 | 20 23 6.6 | 10.5 | 4.0 | 0.28 | 14 | 23 43.4 | 23 15 23.76 | 6 59 7.1 | 6.5 | 2.5 | 0.16 |
| 28 | 22 32.2 | 19 6 39.71 | 20 30 50.5 | 10.3 | 3.9 | 0.28 | 15 | 23 46.2 | 23 22 12.20 | 6 12 7.4 | 6.5 | 2.5 | 0.16 |
| 29 | 22 30.7 | 19 9 5.00 | -20 37 55.5 | 10.1 | 3.8 | 0.27 | 16 | 23 49.1 | 23 29 3.29 | -5 23 57.8 | 6.5 | 2.5 | 0.16 |
| 30 | 22 29.6 | 19 11 51.75 | 20 44 17.0 | 9.9 | 3.7 | 0.27 | 17 | 23 52.1 | 23 35 57.12 | 4 34 40.2 | 6.5 | 2.5 | 0.16 |
| 31 | 22 28.8 | 19 14 58.11 | 20 49 50.8 | 9.7 | 3.7 | 0.26 | 18 | 23 55.2 | 23 42 53.75 | 3 44 16.7 | 6.5 | 2.5 | 0.16 |
| Feb. 1 | 22 28.2 | 19 18 22.33 | 20 54 33.1 | 9.5 | 3.6 | 0.26 | 19 | 23 58.2 | 23 49 53.22 | 2 52 50.0 | 6.5 | 2.5 | 0.16 |
| 2 | 22 28.0 | 19 22 2.77 | 20 58 20.4 | 9.3 | 3.5 | 0.25 | 21 | 0 1.3 | 23 56 55.57 | 2 0 23.2 | 6.5 | 2.5 | 0.16 |
| 3 | 22 27.9 | 19 25 57.97 | -21 1 9.9 | 9.2 | 3.5 | 0.25 | 22 | 0 4.4 | 0 4 0.79 | -1 7 0.0 | 6.5 | 2.5 | 0.16 |
| 4 | 22 28.1 | 19 30 6.58 | 21 2 58.8 | 9.0 | 3.4 | 0.24 | 23 | 0 7.5 | 0 11 8.84 | -0 12 44.6 | 6.6 | 2.5 | 0.16 |
| 5 | 22 28.5 | 19 34 27.41 | 21 3 44.6 | 8.9 | 3.4 | 0.24 | 24 | 0 10.7 | 0 18 19.63 | +0 42 17.8 | 6.6 | 2.5 | 0.17 |
| 6 | 22 29.1 | 19 38 59.38 | 21 3 25.3 | 8.7 | 3.3 | 0.24 | 25 | 0 14.0 | 0 25 33.01 | 1 38 1.5 | 6.6 | 2.5 | 0.17 |
| 7 | 22 29.9 | 19 43 41.45 | 21 1 59.1 | 8.6 | 3.3 | 0.23 | 26 | 0 17.3 | 0 32 48.75 | 2 34 19.7 | 6.7 | 2.5 | 0.17 |
| 8 | 22 30.8 | 19 48 32.73 | -20 59 24.3 | 8.5 | 3.2 | 0.23 | 27 | 0 20.7 | 0 40 6.54 | +3 31 4.7 | 6.7 | 2.5 | 0.17 |
| 9 | 22 31.8 | 19 53 32.42 | 20 55 39.5 | 8.4 | 3.2 | 0.23 | 28 | 0 24.0 | 0 47 25.98 | 4 28 7.7 | 6.8 | 2.5 | 0.17 |
| 10 | 22 33.0 | 19 58 39.77 | 20 50 43.4 | 8.3 | 3.2 | 0.22 | 29 | 0 27.4 | 0 54 46.56 | 5 25 18.9 | 6.8 | 2.6 | 0.17 |
| 11 | 22 34.3 | 20 3 54.13 | 20 44 34.9 | 8.2 | 3.1 | 0.22 | 30 | 0 30.8 | 1 2 7.65 | 6 22 27.5 | 6.9 | 2.6 | 0.18 |
| 12 | 22 35.7 | 20 9 14.90 | 20 37 13.1 | 8.0 | 3.1 | 0.22 | 31 | 0 34.2 | 1 9 28.54 | 7 19 22.1 | 7.0 | 2.6 | 0.18 |
| 13 | 22 37.2 | 20 14 41.51 | -20 28 37.1 | 7.9 | 3.0 | 0.21 | 32 | 0 37.6 | 1 16 48.39 | +8 15 50.0 | 7.0 | 2.7 | 0.18 |
| 14 | 22 38.7 | 20 20 13.48 | -20 18 46.1 | 7.8 | 3.0 | 0.21 | 33 | 0 41.0 | 1 24 6.19 | +9 11 38.0 | 7.1 | 2.7 | 0.18 |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi-diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi-diam. | S.T. of Sem. Pass. Mer. |
|--------|-----------------------|-----------------------------------|----------------------------------|-----------|------------|-------------------------|--------|-----------------------|-----------------------------------|----------------------------------|-----------|------------|-------------------------|
| | h m | h m s | ° ' " | " | " | s | | h m | h m s | ° ' " | " | " | s |
| Apr. 1 | 0 37.6 | 1 16 48.39 | + 8 15 50.0 | 7.0 | 2.7 | 0.18 | May 16 | 23 13.2 | 2 53 32.00 | +14 13 31.3 | 15.5 | 5.8 | 0.41 |
| 2 | 0 41.0 | 1 24 6.19 | 9 11 38.0 | 7.1 | 2.7 | 0.18 | 17 | 23 8.2 | 2 52 28.16 | 13 54 54.0 | 15.3 | 5.8 | 0.40 |
| 3 | 0 44.3 | 1 31 20.89 | 10 6 32.4 | 7.2 | 2.8 | 0.18 | 18 | 23 3.5 | 2 51 38.47 | 13 38 18.9 | 15.1 | 5.7 | 0.39 |
| 4 | 0 47.5 | 1 38 31.34 | 11 0 19.4 | 7.3 | 2.8 | 0.19 | 19 | 22 58.9 | 2 51 3.71 | 13 23 53.7 | 14.9 | 5.7 | 0.39 |
| 5 | 0 50.5 | 1 45 36.29 | 11 52 45.4 | 7.5 | 2.9 | 0.19 | 20 | 22 54.7 | 2 50 44.44 | 13 11 44.0 | 14.7 | 5.6 | 0.38 |
| 6 | 0 53.6 | 1 52 34.43 | +12 43 37.2 | 7.6 | 2.9 | 0.20 | 21 | 22 50.8 | 2 50 41.04 | +13 1 53.1 | 14.4 | 5.5 | 0.37 |
| 7 | 0 56.5 | 1 59 24.47 | 13 32 42.5 | 7.8 | 3.0 | 0.20 | 22 | 22 47.0 | 2 50 53.79 | 12 54 22.9 | 14.2 | 5.4 | 0.37 |
| 8 | 0 59.3 | 2 6 5.11 | 14 19 49.9 | 7.9 | 3.0 | 0.21 | 23 | 22 43.6 | 2 51 22.82 | 12 49 14.0 | 13.9 | 5.3 | 0.36 |
| 9 | 1 1.8 | 2 12 35.06 | 15 4 48.7 | 8.1 | 3.1 | 0.21 | 24 | 22 40.3 | 2 52 8.15 | 12 40 25.6 | 13.7 | 5.2 | 0.36 |
| 10 | 1 4.1 | 2 18 53.02 | 15 47 30.1 | 8.3 | 3.1 | 0.22 | 25 | 22 37.5 | 2 53 9.71 | 12 45 55.4 | 13.4 | 5.1 | 0.35 |
| 11 | 1 6.2 | 2 24 57.79 | +16 27 46.4 | 8.5 | 3.2 | 0.22 | 26 | 22 34.8 | 2 54 27.35 | +12 47 40.3 | 13.2 | 5.0 | 0.34 |
| 12 | 1 8.1 | 2 30 48.26 | 17 5 31.2 | 8.7 | 3.2 | 0.23 | 27 | 22 32.4 | 2 56 0.92 | 12 51 36.6 | 12.9 | 4.9 | 0.33 |
| 13 | 1 9.8 | 2 36 23.33 | 17 40 39.6 | 9.0 | 3.3 | 0.24 | 28 | 22 30.3 | 2 57 50.19 | 12 57 39.8 | 12.7 | 4.8 | 0.33 |
| 14 | 1 11.2 | 2 41 42.02 | 18 13 7.7 | 9.2 | 3.4 | 0.24 | 29 | 22 28.4 | 2 59 54.95 | 13 5 44.9 | 12.5 | 4.7 | 0.32 |
| 15 | 1 12.2 | 2 46 43.40 | 18 42 52.5 | 9.5 | 3.5 | 0.25 | 30 | 22 26.9 | 3 2 14.97 | 13 15 46.6 | 12.1 | 4.6 | 0.31 |
| 16 | 1 13.0 | 2 51 26.65 | +19 9 52.2 | 9.7 | 3.6 | 0.26 | 31 | 22 25.5 | 3 4 49.99 | +13 27 39.3 | 11.8 | 4.5 | 0.30 |
| 17 | 1 13.5 | 2 55 50.97 | 19 34 5.4 | 10.0 | 3.7 | 0.27 | June 1 | 22 24.4 | 3 7 39.79 | 13 41 17.0 | 11.6 | 4.4 | 0.30 |
| 18 | 1 13.6 | 2 59 55.66 | 19 55 31.6 | 10.3 | 3.8 | 0.28 | 2 | 22 23.5 | 3 10 44.15 | 13 56 33.8 | 11.3 | 4.3 | 0.29 |
| 19 | 1 13.4 | 3 3 40.08 | 20 14 10.3 | 10.6 | 4.0 | 0.28 | 3 | 22 22.9 | 3 14 2.89 | 14 13 23.6 | 11.1 | 4.2 | 0.29 |
| 20 | 1 12.9 | 3 7 3.67 | 20 30 1.7 | 10.9 | 4.1 | 0.29 | 4 | 22 22.6 | 3 17 35.84 | 14 31 40.1 | 10.8 | 4.1 | 0.28 |
| 21 | 1 12.0 | 3 10 5.96 | +20 43 6.0 | 11.2 | 4.2 | 0.30 | 5 | 22 22.4 | 3 21 22.88 | +14 51 17.0 | 10.6 | 4.0 | 0.27 |
| 22 | 1 10.7 | 3 12 46.56 | 20 53 23.8 | 11.5 | 4.3 | 0.31 | 6 | 22 22.4 | 3 25 23.92 | 15 12 8.0 | 10.3 | 4.0 | 0.27 |
| 23 | 1 9.1 | 3 15 5.14 | 21 0 55.8 | 11.8 | 4.5 | 0.32 | 7 | 22 22.7 | 3 29 38.89 | 15 34 6.7 | 10.1 | 3.9 | 0.26 |
| 24 | 1 7.2 | 3 17 1.51 | 21 5 42.7 | 12.1 | 4.6 | 0.32 | 8 | 22 23.3 | 3 34 7.75 | 15 57 6.4 | 9.9 | 3.8 | 0.26 |
| 25 | 1 4.8 | 3 18 35.60 | 21 7 45.5 | 12.4 | 4.7 | 0.33 | 9 | 22 24.1 | 3 38 50.49 | 16 21 0.6 | 9.7 | 3.7 | 0.25 |
| 26 | 1 2.0 | 3 19 47.49 | +21 7 5.9 | 12.7 | 4.8 | 0.34 | 10 | 22 25.0 | 3 43 47.17 | +16 45 42.3 | 9.5 | 3.6 | 0.25 |
| 27 | 0 58.9 | 3 20 37.39 | 21 3 46.0 | 13.0 | 4.9 | 0.35 | 11 | 22 26.3 | 3 48 57.86 | 17 11 4.7 | 9.3 | 3.6 | 0.24 |
| 28 | 0 55.4 | 3 21 5.71 | 20 57 48.1 | 13.4 | 5.0 | 0.36 | 12 | 22 27.7 | 3 54 22.64 | 17 37 0.7 | 9.1 | 3.5 | 0.24 |
| 29 | 0 51.6 | 3 21 13.02 | 20 49 15.6 | 13.7 | 5.2 | 0.36 | 13 | 22 29.5 | 4 0 1.61 | 18 3 22.7 | 8.9 | 3.4 | 0.23 |
| 30 | 0 47.5 | 3 21 0.12 | 20 38 12.7 | 14.0 | 5.3 | 0.37 | 14 | 22 31.4 | 4 5 54.91 | 18 30 3.1 | 8.7 | 3.3 | 0.23 |
| May 1 | 0 43.0 | 3 20 28.03 | +20 24 45.0 | 14.3 | 5.4 | 0.38 | 15 | 22 33.6 | 4 12 2.68 | +18 56 53.6 | 8.5 | 3.2 | 0.23 |
| 2 | 0 38.2 | 3 19 38.03 | 20 8 59.7 | 14.6 | 5.5 | 0.39 | 16 | 22 36.0 | 4 18 25.03 | 19 23 45.4 | 8.4 | 3.2 | 0.22 |
| 3 | 0 33.2 | 3 18 31.56 | 19 51 5.0 | 14.8 | 5.6 | 0.39 | 17 | 22 38.7 | 4 25 2.10 | 19 50 29.6 | 8.2 | 3.1 | 0.22 |
| 4 | 0 27.9 | 3 17 10.31 | 19 31 11.3 | 15.1 | 5.6 | 0.40 | 18 | 22 41.5 | 4 31 53.99 | 20 16 56.9 | 8.1 | 3.1 | 0.21 |
| 5 | 0 22.4 | 3 15 36.15 | 19 9 30.9 | 15.3 | 5.7 | 0.40 | 19 | 22 44.7 | 4 39 0.73 | 20 42 57.2 | 7.9 | 3.0 | 0.21 |
| 6 | 0 16.8 | 3 13 51.16 | +18 46 17.6 | 15.5 | 5.8 | 0.41 | 20 | 22 48.2 | 4 46 22.31 | +21 8 19.7 | 7.8 | 3.0 | 0.21 |
| 7 | 0 10.9 | 3 11 57.58 | 18 21 46.6 | 15.7 | 5.8 | 0.41 | 21 | 22 51.8 | 4 53 58.62 | 21 32 53.5 | 7.6 | 2.9 | 0.21 |
| 8 | 0 5.0 | 3 9 57.71 | 17 56 15.3 | 15.8 | 5.9 | 0.41 | 22 | 22 55.7 | 5 1 49.50 | 21 56 26.9 | 7.5 | 2.9 | 0.20 |
| 9 | 23 59.0 | 3 7 53.93 | 17 30 2.3 | 15.9 | 5.9 | 0.42 | 23 | 22 59.8 | 5 9 54.63 | 22 18 47.7 | 7.4 | 2.8 | 0.20 |
| 10 | 23 53.0 | 3 5 48.62 | 17 3 26.6 | 16.0 | 6.0 | 0.42 | 24 | 23 4.2 | 5 18 13.50 | 22 39 44.0 | 7.3 | 2.8 | 0.20 |
| 11 | 23 47.0 | 3 3 44.17 | +16 36 48.0 | 16.0 | 6.0 | 0.42 | 25 | 23 8.8 | 5 26 45.49 | +22 59 3.3 | 7.2 | 2.7 | 0.20 |
| 12 | 23 41.0 | 3 1 42.83 | 16 10 26.6 | 15.9 | 6.0 | 0.42 | 26 | 23 13.6 | 5 35 29.84 | 23 16 33.4 | 7.1 | 2.7 | 0.20 |
| 13 | 23 35.2 | 2 59 46.76 | 15 44 41.6 | 15.9 | 6.0 | 0.42 | 27 | 23 18.5 | 5 44 25.53 | 23 32 2.4 | 7.0 | 2.6 | 0.19 |
| 14 | 23 29.5 | 2 57 57.92 | 15 19 51.2 | 15.8 | 5.9 | 0.41 | 28 | 23 23.6 | 5 53 31.37 | 23 45 19.2 | 7.0 | 2.6 | 0.19 |
| 15 | 23 23.8 | 2 56 18.16 | 14 56 12.6 | 15.7 | 5.9 | 0.41 | 29 | 23 28.9 | 6 2 46.01 | 23 56 13.7 | 6.9 | 2.6 | 0.19 |
| 16 | 23 18.5 | 2 54 49.06 | +14 34 1.3 | 15.6 | 5.9 | 0.41 | 30 | 23 34.4 | 6 12 7.96 | +24 4 36.9 | 6.8 | 2.6 | 0.19 |
| 17 | 23 13.2 | 2 53 32.00 | +14 13 31.3 | 15.5 | 5.8 | 0.41 | 31 | 23 39.9 | 6 21 35.56 | +24 10 21.4 | 6.8 | 2.6 | 0.19 |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. |
|--------|--------------------------------|--|---|--------------|----------------|----------------------------------|---------|--------------------------------|--|---|--------------|----------------|----------------------------------|
| | h m | h m s | ° ' " | " | " | s | | h m | h m s | ° ' " | " | " | s |
| July 1 | 23 39.9 | 6 21 35.56 | +24 10 21.4 | 6.8 | 2.6 | 0.19 | Aug. 17 | 1 43.4 | 11 26 53.36 | +1 19 42.7 | 9.8 | 3.6 | 0.24 |
| 2 | 23 45.4 | 6 31 7.10 | 24 13 21.6 | 6.8 | 2.6 | 0.19 | 18 | 1 42.5 | 11 29 54.57 | 0 48 55.6 | 10.0 | 3.7 | 0.25 |
| 3 | 23 51.0 | 6 40 40.80 | 24 13 34.4 | 6.7 | 2.5 | 0.19 | 19 | 1 41.5 | 11 32 44.56 | +0 19 21.5 | 10.2 | 3.8 | 0.25 |
| 4 | 23 56.6 | 6 50 14.88 | 24 10 57.1 | 6.7 | 2.5 | 0.18 | 20 | 1 40.1 | 11 35 22.80 | -0 8 53.5 | 10.3 | 3.9 | 0.26 |
| 6 | 0 2.2 | 6 59 47.62 | 24 5 30.5 | 6.7 | 2.5 | 0.18 | 21 | 1 38.6 | 11 37 48.71 | 0 35 42.6 | 10.5 | 3.9 | 0.26 |
| 7 | 0 7.8 | 7 9 17.41 | +23 57 17.0 | 6.7 | 2.5 | 0.18 | 22 | 1 36.9 | 11 40 1.62 | -1 0 58.4 | 10.7 | 4.0 | 0.27 |
| 8 | 0 13.3 | 7 18 42.72 | 23 46 20.5 | 6.7 | 2.5 | 0.18 | 23 | 1 35.0 | 11 42 0.84 | 1 24 33.1 | 10.9 | 4.1 | 0.27 |
| 9 | 0 18.6 | 7 28 2.17 | 23 32 45.9 | 6.7 | 2.5 | 0.18 | 24 | 1 32.8 | 11 43 45.65 | 1 46 17.9 | 11.1 | 4.2 | 0.28 |
| 10 | 0 23.8 | 7 37 14.60 | 23 16 39.8 | 6.7 | 2.5 | 0.18 | 25 | 1 30.4 | 11 45 15.25 | 2 6 3.7 | 11.3 | 4.3 | 0.28 |
| 11 | 0 29.0 | 7 46 18.98 | 22 58 9.9 | 6.7 | 2.5 | 0.18 | 26 | 1 27.6 | 11 46 28.81 | 2 23 41.0 | 11.5 | 4.4 | 0.29 |
| 12 | 0 34.0 | 7 55 14.45 | +22 37 24.2 | 6.7 | 2.5 | 0.18 | 27 | 1 24.6 | 11 47 25.50 | -2 38 59.3 | 11.7 | 4.4 | 0.29 |
| 13 | 0 38.7 | 8 4 0.33 | 22 14 31.0 | 6.7 | 2.5 | 0.18 | 28 | 1 21.4 | 11 48 4.47 | 2 51 47.9 | 11.9 | 4.5 | 0.30 |
| 14 | 0 43.4 | 8 12 36.08 | 21 49 39.1 | 6.7 | 2.5 | 0.18 | 29 | 1 17.7 | 11 48 24.90 | 3 1 55.4 | 12.1 | 4.6 | 0.30 |
| 15 | 0 47.9 | 8 21 1.34 | 21 22 57.6 | 6.8 | 2.5 | 0.18 | 30 | 1 13.8 | 11 48 26.02 | 3 9 10.1 | 12.3 | 4.7 | 0.31 |
| 16 | 0 52.1 | 8 29 15.82 | 20 54 35.2 | 6.8 | 2.6 | 0.18 | 31 | 1 9.6 | 11 48 7.11 | 3 13 20.1 | 12.5 | 4.7 | 0.31 |
| 17 | 0 56.3 | 8 37 19.38 | +20 24 40.4 | 6.8 | 2.6 | 0.18 | Sept. 1 | 1 5.0 | 11 47 27.62 | -3 14 14.1 | 12.7 | 4.8 | 0.32 |
| 18 | 1 0.1 | 8 45 11.95 | 19 53 21.5 | 6.9 | 2.6 | 0.19 | 2 | 1 0.0 | 11 46 27.18 | 3 11 41.1 | 12.9 | 4.9 | 0.32 |
| 19 | 1 3.9 | 8 52 53.54 | 19 20 46.5 | 6.9 | 2.6 | 0.19 | 3 | 0 54.8 | 11 45 5.61 | 3 5 31.5 | 13.1 | 4.9 | 0.33 |
| 20 | 1 7.4 | 9 0 24.21 | 18 47 3.0 | 7.0 | 2.6 | 0.19 | 4 | 0 49.2 | 11 43 23.14 | 2 55 37.6 | 13.3 | 5.0 | 0.33 |
| 21 | 1 10.8 | 9 7 44.08 | 18 12 18.2 | 7.0 | 2.6 | 0.19 | 5 | 0 43.2 | 11 41 20.31 | 2 41 54.5 | 13.4 | 5.0 | 0.34 |
| 22 | 1 14.0 | 9 14 53.33 | +17 36 38.8 | 7.1 | 2.7 | 0.19 | 6 | 0 36.8 | 11 38 58.13 | -2 24 20.3 | 13.6 | 5.1 | 0.34 |
| 23 | 1 17.0 | 9 21 52.12 | 17 0 11.3 | 7.2 | 2.7 | 0.19 | 7 | 0 30.3 | 11 36 18.17 | 2 2 58.0 | 13.7 | 5.1 | 0.34 |
| 24 | 1 19.9 | 9 28 40.63 | 16 23 1.8 | 7.2 | 2.7 | 0.19 | 8 | 0 23.4 | 11 33 22.56 | 1 37 55.6 | 13.8 | 5.2 | 0.35 |
| 25 | 1 22.6 | 9 35 19.07 | 15 45 16.3 | 7.3 | 2.7 | 0.19 | 9 | 0 16.4 | 11 30 14.03 | 1 9 27.5 | 13.8 | 5.2 | 0.35 |
| 26 | 1 25.1 | 9 41 47.66 | 15 7 0.0 | 7.4 | 2.8 | 0.19 | 10 | 0 9.1 | 11 26 55.89 | 0 37 54.7 | 13.9 | 5.2 | 0.35 |
| 27 | 1 27.5 | 9 48 6.62 | +14 28 18.0 | 7.4 | 2.8 | 0.19 | 11 | 0 1.8 | 11 23 32.07 | -0 3 44.7 | 13.8 | 5.2 | 0.35 |
| 28 | 1 29.7 | 9 54 16.16 | 13 49 15.1 | 7.5 | 2.8 | 0.20 | 11 | 23 54.4 | 11 20 6.94 | +0 32 28.7 | 13.8 | 5.2 | 0.35 |
| 29 | 1 31.8 | 10 0 16.47 | 13 9 56.2 | 7.6 | 2.9 | 0.20 | 12 | 23 47.1 | 11 16 45.24 | 1 10 6.0 | 13.7 | 5.2 | 0.35 |
| 30 | 1 33.7 | 10 6 7.70 | 12 30 25.6 | 7.7 | 2.9 | 0.20 | 13 | 23 40.0 | 11 13 31.95 | 1 48 23.1 | 13.6 | 5.1 | 0.34 |
| 31 | 1 35.5 | 10 11 50.03 | 11 50 47.2 | 7.8 | 2.9 | 0.20 | 14 | 23 33.1 | 11 10 32.01 | 2 26 33.8 | 13.4 | 5.1 | 0.34 |
| Aug. 1 | 1 37.1 | 10 17 23.62 | 11 11 5.4 | 7.9 | 3.0 | 0.20 | 15 | 23 26.5 | 11 7 50.22 | +3 3 50.7 | 13.2 | 5.0 | 0.33 |
| 2 | 1 38.5 | 10 22 48.59 | 10 31 24.1 | 8.0 | 3.0 | 0.21 | 16 | 23 20.2 | 11 5 31.04 | 3 39 28.2 | 12.9 | 4.9 | 0.33 |
| 3 | 1 39.8 | 10 28 5.05 | 9 51 47.1 | 8.0 | 3.0 | 0.21 | 17 | 23 14.4 | 11 3 38.43 | 4 12 43.1 | 12.6 | 4.8 | 0.32 |
| 4 | 1 41.0 | 10 33 13.08 | 9 12 18.0 | 8.1 | 3.1 | 0.21 | 18 | 23 9.1 | 11 2 15.67 | 4 42 56.6 | 12.3 | 4.7 | 0.31 |
| 5 | 1 42.1 | 10 38 12.72 | 8 33 0.7 | 8.2 | 3.1 | 0.21 | 19 | 23 4.3 | 11 1 25.38 | 5 9 35.5 | 11.9 | 4.5 | 0.31 |
| 6 | 1 43.0 | 10 43 4.00 | +7 53 58.6 | 8.4 | 3.2 | 0.21 | 20 | 23 0.1 | 11 1 9.38 | +5 32 12.6 | 11.6 | 4.4 | 0.30 |
| 7 | 1 43.8 | 10 47 46.93 | 7 15 15.5 | 8.5 | 3.2 | 0.22 | 21 | 22 56.6 | 11 1 28.69 | 5 50 27.2 | 11.2 | 4.3 | 0.29 |
| 8 | 1 44.4 | 10 52 21.50 | 6 36 55.0 | 8.6 | 3.3 | 0.22 | 22 | 22 53.6 | 11 2 23.56 | 6 4 4.6 | 10.9 | 4.1 | 0.28 |
| 9 | 1 44.9 | 10 56 47.63 | 5 59 1.0 | 8.7 | 3.3 | 0.22 | 23 | 22 51.1 | 11 3 53.61 | 6 12 56.6 | 10.6 | 4.0 | 0.27 |
| 10 | 1 45.2 | 11 1 5.22 | 5 21 37.3 | 8.8 | 3.3 | 0.22 | 24 | 22 49.2 | 11 5 57.84 | 6 17 0.1 | 10.2 | 3.8 | 0.26 |
| 11 | 1 45.4 | 11 5 14.13 | +4 44 47.5 | 9.0 | 3.4 | 0.22 | 25 | 22 47.0 | 11 8 34.70 | +6 16 16.6 | 9.9 | 3.7 | 0.26 |
| 12 | 1 45.5 | 11 9 14.21 | 4 8 35.6 | 9.1 | 3.4 | 0.23 | 26 | 22 47.1 | 11 11 42.21 | 6 10 53.0 | 9.6 | 3.6 | 0.25 |
| 13 | 1 45.4 | 11 13 5.25 | 3 33 6.1 | 9.3 | 3.5 | 0.23 | 27 | 22 46.8 | 11 15 18.07 | 6 0 59.2 | 9.3 | 3.5 | 0.24 |
| 14 | 1 45.1 | 11 16 47.00 | 2 58 23.4 | 9.4 | 3.5 | 0.23 | 28 | 22 46.8 | 11 19 19.77 | 5 46 48.2 | 9.0 | 3.4 | 0.23 |
| 15 | 1 44.8 | 11 20 19.17 | 2 24 32.0 | 9.5 | 3.5 | 0.23 | 29 | 22 47.3 | 11 23 44.66 | 5 28 35.8 | 8.8 | 3.3 | 0.23 |
| 16 | 1 44.2 | 11 23 41.41 | +1 51 36.7 | 9.6 | 3.6 | 0.24 | 30 | 22 48.1 | 11 28 30.10 | +5 6 39.7 | 8.6 | 3.2 | 0.22 |
| 17 | 1 43.4 | 11 26 53.36 | +1 19 42.7 | 9.8 | 3.6 | 0.24 | 31 | 22 49.3 | 11 33 33.46 | +4 41 18.5 | 8.4 | 3.1 | 0.21 |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi-diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi-diam. | S.T. of Sem. Pass. Mer. |
|--------|-----------------------|-----------------------------------|----------------------------------|-----------|------------|-------------------------|---------|-----------------------|-----------------------------------|----------------------------------|-----------|------------|-------------------------|
| | h m | h m s | ° ' " | " | " | s | | h m | h m s | ° ' " | " | " | s |
| Oct. 1 | 22 49.3 | 11 33 33.46 | + 4 41 18.5 | 8.4 | 3.1 | 0.21 | Nov. 17 | 0 32.8 | 16 18 46.64 | -23 7 4.6 | 6.4 | 2.4 | 0.17 |
| 2 | 22 50.6 | 11 38 52.21 | 4 12 51.6 | 8.2 | 3.1 | 0.21 | 18 | 0 35.3 | 16 25 14.39 | 23 26 58.2 | 6.4 | 2.4 | 0.17 |
| 3 | 22 52.1 | 11 44 23.98 | 3 41 38.5 | 8.0 | 3.0 | 0.20 | 19 | 0 37.8 | 16 31 42.95 | 23 45 40.8 | 6.5 | 2.5 | 0.18 |
| 4 | 22 53.9 | 11 50 6.61 | 3 7 58.4 | 7.9 | 3.0 | 0.20 | 20 | 0 40.4 | 16 38 12.16 | 24 3 10.8 | 6.5 | 2.5 | 0.18 |
| 5 | 22 55.8 | 11 55 58.16 | 2 32 10.1 | 7.7 | 2.9 | 0.20 | 21 | 0 42.7 | 16 44 41.87 | 24 19 26.7 | 6.6 | 2.5 | 0.18 |
| 6 | 22 57.8 | 12 1 56.89 | + 1 54 31.3 | 7.5 | 2.9 | 0.19 | 22 | 0 45.4 | 16 51 11.89 | -24 34 27.0 | 6.7 | 2.5 | 0.18 |
| 7 | 23 0.1 | 12 8 1.27 | 1 15 18.5 | 7.3 | 2.8 | 0.19 | 23 | 0 48.0 | 16 57 41.99 | 24 48 10.4 | 6.7 | 2.5 | 0.18 |
| 8 | 23 2.3 | 12 14 9.99 | + 0 34 47.1 | 7.2 | 2.8 | 0.19 | 24 | 0 50.6 | 17 4 11.91 | 25 0 35.5 | 6.8 | 2.6 | 0.19 |
| 9 | 23 4.5 | 12 20 21.98 | - 0 6 48.8 | 7.1 | 2.7 | 0.18 | 25 | 0 53.1 | 17 10 41.35 | 25 11 40.9 | 6.8 | 2.6 | 0.19 |
| 10 | 23 6.8 | 12 26 36.31 | 0 49 16.2 | 7.0 | 2.7 | 0.18 | 26 | 0 55.6 | 17 17 9.93 | 25 21 25.1 | 6.9 | 2.6 | 0.19 |
| 11 | 23 9.1 | 12 32 52.22 | - 1 32 23.7 | 6.9 | 2.7 | 0.18 | 27 | 0 58.1 | 17 23 37.23 | -25 29 47.0 | 7.0 | 2.6 | 0.19 |
| 12 | 23 11.4 | 12 39 9.10 | 2 16 0.9 | 6.8 | 2.6 | 0.17 | 28 | 1 0.6 | 17 30 2.79 | 25 36 45.2 | 7.1 | 2.7 | 0.20 |
| 13 | 23 13.7 | 12 45 26.49 | 2 59 58.6 | 6.7 | 2.6 | 0.17 | 29 | 1 3.1 | 17 36 26.05 | 25 42 18.8 | 7.1 | 2.7 | 0.20 |
| 14 | 23 16.1 | 12 51 43.99 | 3 44 8.3 | 6.7 | 2.6 | 0.17 | 30 | 1 5.5 | 17 42 46.38 | 25 46 26.9 | 7.2 | 2.7 | 0.20 |
| 15 | 23 18.4 | 12 58 1.30 | 4 28 22.7 | 6.6 | 2.5 | 0.17 | Dec. 1 | 1 7.8 | 17 49 3.09 | 25 49 8.9 | 7.3 | 2.8 | 0.21 |
| 16 | 23 20.7 | 13 4 18.24 | - 5 12 35.4 | 6.6 | 2.5 | 0.16 | 2 | 1 10.0 | 17 55 15.36 | -25 50 24.0 | 7.4 | 2.8 | 0.21 |
| 17 | 23 23.1 | 13 10 34.68 | 5 56 40.8 | 6.5 | 2.4 | 0.16 | 3 | 1 12.1 | 18 1 22.27 | 25 50 12.1 | 7.5 | 2.9 | 0.21 |
| 18 | 23 25.4 | 13 16 50.52 | 6 40 33.8 | 6.5 | 2.4 | 0.16 | 4 | 1 14.2 | 18 7 22.76 | 25 48 33.4 | 7.7 | 2.9 | 0.22 |
| 19 | 23 27.7 | 13 23 5.75 | 7 24 9.8 | 6.4 | 2.4 | 0.16 | 5 | 1 16.2 | 18 13 15.65 | 25 45 28.1 | 7.8 | 3.0 | 0.22 |
| 20 | 23 30.0 | 13 29 20.33 | 8 7 24.8 | 6.4 | 2.4 | 0.16 | 6 | 1 18.0 | 18 18 59.60 | 25 40 57.2 | 8.0 | 3.0 | 0.23 |
| 21 | 23 32.3 | 13 35 34.32 | - 8 50 15.2 | 6.4 | 2.4 | 0.16 | 7 | 1 19.6 | 18 24 33.12 | -25 35 2.0 | 8.1 | 3.1 | 0.23 |
| 22 | 23 34.6 | 13 41 47.75 | 9 32 37.9 | 6.3 | 2.4 | 0.16 | 8 | 1 21.0 | 18 29 54.46 | 25 27 44.6 | 8.3 | 3.2 | 0.23 |
| 23 | 23 36.8 | 13 48 0.69 | 10 14 30.2 | 6.3 | 2.4 | 0.16 | 9 | 1 22.2 | 18 35 1.69 | 25 19 7.6 | 8.5 | 3.2 | 0.24 |
| 24 | 23 39.1 | 13 54 13.21 | 10 55 49.2 | 6.3 | 2.4 | 0.16 | 10 | 1 23.2 | 18 39 52.66 | 25 9 14.4 | 8.7 | 3.3 | 0.24 |
| 25 | 23 41.4 | 14 0 25.40 | 11 36 32.6 | 6.3 | 2.3 | 0.16 | 11 | 1 23.8 | 18 44 24.96 | 24 58 9.1 | 8.9 | 3.3 | 0.25 |
| 26 | 23 43.6 | 14 6 37.39 | -12 16 38.5 | 6.2 | 2.3 | 0.16 | 12 | 1 23.9 | 18 48 35.92 | -24 45 56.8 | 9.1 | 3.4 | 0.25 |
| 27 | 23 45.8 | 14 12 49.29 | 12 56 4.7 | 6.2 | 2.3 | 0.16 | 13 | 1 23.7 | 18 52 22.58 | 24 32 43.8 | 9.3 | 3.5 | 0.26 |
| 28 | 23 48.1 | 14 19 1.18 | 13 34 49.4 | 6.2 | 2.3 | 0.16 | 14 | 1 23.1 | 18 55 41.71 | 24 18 37.2 | 9.6 | 3.6 | 0.26 |
| 29 | 23 50.4 | 14 25 13.16 | 14 12 51.0 | 6.2 | 2.3 | 0.16 | 15 | 1 22.0 | 18 58 29.95 | 24 3 44.5 | 9.8 | 3.7 | 0.27 |
| 30 | 23 52.6 | 14 31 25.38 | 14 50 7.9 | 6.1 | 2.3 | 0.16 | 16 | 1 20.3 | 19 0 43.70 | 23 46 14.7 | 10.1 | 3.8 | 0.27 |
| 31 | 23 54.9 | 14 37 37.92 | -15 26 38.6 | 6.1 | 2.3 | 0.16 | 17 | 1 18.0 | 19 2 19.31 | -23 32 17.4 | 10.4 | 3.9 | 0.28 |
| Nov. 1 | 23 57.1 | 14 43 50.89 | 16 2 21.4 | 6.1 | 2.3 | 0.16 | 18 | 1 14.8 | 19 3 13.18 | 23 16 2.6 | 10.7 | 4.0 | 0.29 |
| 2 | 23 59.4 | 14 50 4.38 | 16 37 14.9 | 6.1 | 2.3 | 0.16 | 19 | 1 11.1 | 19 3 22.06 | 22 59 40.3 | 11.0 | 4.1 | 0.29 |
| 3 | 0 1.7 | 14 56 18.49 | 17 11 17.8 | 6.1 | 2.3 | 0.16 | 20 | 1 6.6 | 19 2 43.22 | 22 43 20.6 | 11.3 | 4.3 | 0.30 |
| 4 | 0 4.0 | 15 2 33.31 | 17 44 28.9 | 6.1 | 2.3 | 0.16 | 21 | 1 1.2 | 19 1 14.82 | 22 27 12.9 | 11.6 | 4.4 | 0.31 |
| 5 | 0 6.3 | 15 8 48.91 | -18 16 46.7 | 6.2 | 2.3 | 0.16 | 22 | 0 54.9 | 18 58 56.27 | -22 11 25.3 | 11.9 | 4.5 | 0.32 |
| 6 | 0 8.6 | 15 15 5.37 | 18 48 9.9 | 6.2 | 2.3 | 0.16 | 23 | 0 48.0 | 18 55 48.60 | 21 56 5.5 | 12.1 | 4.6 | 0.32 |
| 7 | 0 11.0 | 15 21 22.77 | 19 18 37.1 | 6.2 | 2.3 | 0.16 | 24 | 0 40.1 | 18 51 54.81 | 21 41 20.4 | 12.3 | 4.7 | 0.33 |
| 8 | 0 13.3 | 15 27 41.15 | 19 48 7.1 | 6.2 | 2.3 | 0.16 | 25 | 0 31.5 | 18 47 20.01 | 21 27 16.0 | 12.6 | 4.8 | 0.34 |
| 9 | 0 15.7 | 15 34 0.57 | 20 16 38.4 | 6.2 | 2.3 | 0.17 | 26 | 0 22.5 | 18 42 11.48 | 21 13 58.7 | 12.8 | 4.8 | 0.34 |
| 10 | 0 18.1 | 15 40 21.06 | -20 44 9.9 | 6.2 | 2.3 | 0.17 | 27 | 0 13.1 | 18 36 38.39 | -21 1 35.7 | 13.0 | 4.9 | 0.35 |
| 11 | 0 20.5 | 15 46 42.62 | 21 10 40.2 | 6.2 | 2.4 | 0.17 | 28 | 0 3.3 | 18 30 51.23 | 20 50 15.0 | 13.1 | 4.9 | 0.35 |
| 12 | 0 22.9 | 15 53 5.29 | 21 36 7.8 | 6.3 | 2.4 | 0.17 | 29 | 23 53.6 | 18 25 1.27 | 20 40 6.2 | 13.2 | 5.0 | 0.35 |
| 13 | 0 25.3 | 15 59 29.06 | 22 0 31.4 | 6.3 | 2.4 | 0.17 | 30 | 23 44.1 | 18 19 19.53 | 20 31 19.4 | 13.1 | 5.0 | 0.35 |
| 14 | 0 27.8 | 16 5 53.91 | 22 23 49.8 | 6.3 | 2.4 | 0.17 | 31 | 23 34.8 | 18 13 56.20 | 20 24 4.4 | 13.0 | 4.9 | 0.35 |
| 15 | 0 30.4 | 16 12 19.79 | -22 46 1.3 | 6.4 | 2.4 | 0.17 | 32 | 23 25.9 | 18 8 50.92 | -20 18 29.9 | 12.9 | 4.9 | 0.35 |
| 16 | 0 32.8 | 16 18 46.64 | -23 7 4.6 | 6.4 | 2.4 | 0.17 | | | | | | | |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. |
|--------|--------------------------------|--|---|--------------|----------------|----------------------------------|---------|--------------------------------|--|---|--------------|----------------|----------------------------------|
| | h m | h m s | ° ' " | " | " | s | | h m | h m s | ° ' " | " | " | s |
| Jan. 0 | 21 34.4 | 16 18 8.99 | -16 49 13.7 | 24.2 | 23.4 | 1.63 | Feb. 15 | 21 1.4 | 18 46 26.24 | -19 53 39.5 | 12.7 | 12.3 | 0.87 |
| 1 | 21 31.8 | 16 19 29.47 | 16 48 50.5 | 23.9 | 23.0 | 1.60 | 16 | 21 1.8 | 18 50 49.52 | 19 53 11.1 | 12.5 | 12.1 | 0.86 |
| 2 | 21 29.3 | 16 20 57.69 | 16 49 8.4 | 23.5 | 22.6 | 1.58 | 17 | 21 2.3 | 18 55 14.18 | 19 52 15.5 | 12.4 | 12.0 | 0.85 |
| 3 | 21 26.9 | 16 22 33.42 | 16 50 5.3 | 23.1 | 22.3 | 1.55 | 18 | 21 2.8 | 18 59 40.14 | 19 50 52.3 | 12.2 | 11.8 | 0.84 |
| 4 | 21 24.8 | 16 24 16.42 | 16 51 38.8 | 22.7 | 21.9 | 1.53 | 19 | 21 3.3 | 19 4 7.35 | 19 49 0.9 | 12.1 | 11.7 | 0.83 |
| 5 | 21 22.7 | 16 26 6.43 | -16 53 46.5 | 22.3 | 21.6 | 1.50 | 20 | 21 3.8 | 19 8 35.73 | -19 46 40.9 | 12.0 | 11.6 | 0.82 |
| 6 | 21 20.6 | 16 28 3.21 | 16 56 25.9 | 21.9 | 21.2 | 1.48 | 21 | 21 4.3 | 19 13 5.92 | 19 43 52.1 | 11.8 | 11.4 | 0.81 |
| 7 | 21 18.7 | 16 30 6.54 | 16 59 34.8 | 21.6 | 20.9 | 1.45 | 22 | 21 4.8 | 19 17 35.74 | 19 40 33.9 | 11.7 | 11.3 | 0.81 |
| 8 | 21 16.9 | 16 32 16.19 | 17 3 10.7 | 21.2 | 20.6 | 1.43 | 23 | 21 5.4 | 19 22 7.22 | 19 36 46.1 | 11.6 | 11.2 | 0.80 |
| 9 | 21 15.3 | 16 34 31.95 | 17 7 11.4 | 20.9 | 20.2 | 1.41 | 24 | 21 6.0 | 19 26 39.61 | 19 32 28.5 | 11.5 | 11.1 | 0.79 |
| 10 | 21 13.7 | 16 36 53.61 | -17 11 34.8 | 20.6 | 19.9 | 1.39 | 25 | 21 6.6 | 19 31 12.84 | -19 27 40.8 | 11.4 | 11.0 | 0.78 |
| 11 | 21 12.2 | 16 39 20.97 | 17 16 18.5 | 20.3 | 19.6 | 1.37 | 26 | 21 7.2 | 19 35 46.84 | 19 22 22.8 | 11.3 | 10.9 | 0.77 |
| 12 | 21 10.8 | 16 41 53.83 | 17 21 20.5 | 20.0 | 19.3 | 1.35 | 27 | 21 7.9 | 19 40 21.52 | 19 16 34.4 | 11.2 | 10.8 | 0.77 |
| 13 | 21 9.5 | 16 44 32.01 | 17 26 38.5 | 19.6 | 19.0 | 1.33 | 28 | 21 8.5 | 19 44 56.83 | 19 10 15.3 | 11.1 | 10.7 | 0.76 |
| 14 | 21 8.2 | 16 47 15.33 | 17 32 10.6 | 19.3 | 18.7 | 1.31 | Mar. 1 | 21 9.2 | 19 49 32.70 | 19 3 25.5 | 11.0 | 10.6 | 0.75 |
| 15 | 21 7.1 | 16 50 3.63 | -17 37 54.8 | 19.0 | 18.4 | 1.29 | 2 | 21 9.9 | 19 54 9.07 | -18 56 4.7 | 10.9 | 10.5 | 0.74 |
| 16 | 21 6.1 | 16 52 56.74 | 17 43 49.3 | 18.7 | 18.1 | 1.27 | 3 | 21 10.6 | 19 58 45.86 | 18 48 13.0 | 10.8 | 10.4 | 0.74 |
| 17 | 21 5.1 | 16 55 54.51 | 17 49 52.2 | 18.4 | 17.8 | 1.25 | 4 | 21 11.3 | 20 3 23.02 | 18 39 50.3 | 10.7 | 10.3 | 0.73 |
| 18 | 21 4.2 | 16 58 56.80 | 17 56 1.7 | 18.1 | 17.6 | 1.24 | 5 | 21 12.0 | 20 8 0.49 | 18 30 56.8 | 10.6 | 10.2 | 0.72 |
| 19 | 21 3.4 | 17 2 3.47 | 18 2 16.0 | 17.9 | 17.3 | 1.22 | 6 | 21 12.7 | 20 12 38.20 | 18 21 32.7 | 10.5 | 10.1 | 0.71 |
| 20 | 21 2.7 | 17 5 14.36 | -18 8 33.3 | 17.6 | 17.0 | 1.20 | 7 | 21 13.3 | 20 17 16.10 | -18 11 38.0 | 10.4 | 10.0 | 0.71 |
| 21 | 21 2.0 | 17 8 29.35 | 18 14 52.1 | 17.4 | 16.8 | 1.18 | 8 | 21 14.0 | 20 21 54.14 | 18 1 12.9 | 10.3 | 9.9 | 0.70 |
| 22 | 21 1.4 | 17 11 48.32 | 18 21 10.8 | 17.1 | 16.5 | 1.17 | 9 | 21 14.6 | 20 26 32.25 | 17 50 17.5 | 10.2 | 9.8 | 0.69 |
| 23 | 21 0.8 | 17 15 11.16 | 18 27 27.7 | 16.9 | 16.3 | 1.15 | 10 | 21 15.3 | 20 31 10.38 | 17 38 52.0 | 10.1 | 9.8 | 0.69 |
| 24 | 21 0.3 | 17 18 37.74 | 18 33 41.2 | 16.6 | 16.1 | 1.14 | 11 | 21 16.0 | 20 35 48.50 | 17 26 56.6 | 10.0 | 9.7 | 0.68 |
| 25 | 20 59.8 | 17 22 7.94 | -18 39 49.8 | 16.4 | 15.9 | 1.12 | 12 | 21 16.7 | 20 40 26.55 | -17 14 31.4 | 9.9 | 9.6 | 0.67 |
| 26 | 20 59.4 | 17 25 41.65 | 18 45 52.2 | 16.2 | 15.7 | 1.11 | 13 | 21 17.3 | 20 45 4.49 | 17 1 36.9 | 9.8 | 9.5 | 0.67 |
| 27 | 20 59.1 | 17 29 18.75 | 18 51 46.8 | 16.0 | 15.5 | 1.09 | 14 | 21 18.0 | 20 49 42.29 | 16 48 13.3 | 9.7 | 9.4 | 0.66 |
| 28 | 20 58.9 | 17 32 59.12 | 18 57 32.4 | 15.8 | 15.2 | 1.08 | 15 | 21 18.7 | 20 54 19.91 | 16 34 20.8 | 9.7 | 9.4 | 0.65 |
| 29 | 20 58.7 | 17 36 42.66 | 19 3 7.5 | 15.6 | 15.0 | 1.06 | 16 | 21 19.4 | 20 58 57.32 | 16 19 59.8 | 9.6 | 9.3 | 0.65 |
| 30 | 20 58.5 | 17 40 29.26 | -19 8 30.9 | 15.4 | 14.8 | 1.05 | 17 | 21 20.1 | 21 3 34.49 | -16 5 10.7 | 9.5 | 9.2 | 0.64 |
| 31 | 20 58.3 | 17 44 18.81 | 19 13 41.2 | 15.2 | 14.6 | 1.04 | 18 | 21 20.8 | 21 8 11.39 | 15 49 53.7 | 9.5 | 9.1 | 0.63 |
| Feb. 1 | 20 58.2 | 17 48 11.20 | 19 18 37.5 | 15.0 | 14.4 | 1.02 | 19 | 21 21.4 | 21 12 47.99 | 15 34 9.6 | 9.4 | 9.1 | 0.63 |
| 2 | 20 58.2 | 17 52 6.31 | 19 23 18.5 | 14.8 | 14.3 | 1.01 | 20 | 21 22.1 | 21 17 24.29 | 15 17 58.0 | 9.3 | 9.0 | 0.62 |
| 3 | 20 58.2 | 17 56 4.05 | 19 27 43.1 | 14.6 | 14.1 | 0.99 | 21 | 21 22.7 | 21 22 0.25 | 15 1 19.9 | 9.3 | 8.9 | 0.62 |
| 4 | 20 58.3 | 18 0 4.30 | -19 31 50.2 | 14.4 | 13.9 | 0.98 | 22 | 21 23.4 | 21 26 35.86 | -14 44 15.5 | 9.2 | 8.9 | 0.61 |
| 5 | 20 58.4 | 18 4 6.98 | 19 35 38.9 | 14.2 | 13.7 | 0.97 | 23 | 21 24.0 | 21 31 11.09 | 14 26 45.2 | 9.1 | 8.8 | 0.60 |
| 6 | 20 58.5 | 18 8 11.98 | 19 30 8.1 | 14.0 | 13.6 | 0.96 | 24 | 21 24.7 | 21 35 45.94 | 14 8 49.5 | 9.1 | 8.7 | 0.60 |
| 7 | 20 58.7 | 18 12 19.21 | 19 42 16.9 | 13.8 | 13.4 | 0.94 | 25 | 21 25.3 | 21 40 30.39 | 13 50 29.0 | 9.0 | 8.7 | 0.59 |
| 8 | 20 59.0 | 18 16 28.57 | 19 45 4.4 | 13.7 | 13.3 | 0.93 | 26 | 21 26.0 | 21 44 54.44 | 13 31 44.0 | 8.9 | 8.6 | 0.59 |
| 9 | 20 59.3 | 18 20 39.97 | -19 47 30.0 | 13.5 | 13.1 | 0.92 | 27 | 21 26.6 | 21 49 28.09 | -13 12 35.0 | 8.9 | 8.5 | 0.58 |
| 10 | 20 59.6 | 18 24 53.31 | 19 40 32.8 | 13.3 | 13.0 | 0.91 | 28 | 21 27.2 | 21 54 1.31 | 12 53 2.4 | 8.8 | 8.5 | 0.58 |
| 11 | 20 59.9 | 18 29 8.51 | 19 51 12.0 | 13.2 | 12.8 | 0.90 | 29 | 21 27.8 | 21 58 34.08 | 12 33 6.9 | 8.7 | 8.4 | 0.57 |
| 12 | 21 0.2 | 18 33 25.49 | 19 52 26.8 | 13.0 | 12.7 | 0.90 | 30 | 21 28.4 | 22 3 6.42 | 12 12 48.9 | 8.7 | 8.3 | 0.57 |
| 13 | 21 0.6 | 18 37 44.16 | 19 53 16.8 | 12.9 | 12.6 | 0.89 | 31 | 21 29.0 | 22 7 38.29 | 11 52 8.9 | 8.6 | 8.3 | 0.56 |
| 14 | 21 1.0 | 18 42 4.43 | -19 53 41.2 | 12.8 | 12.4 | 0.88 | 32 | 21 29.6 | 22 12 9.71 | -11 31 7.6 | 8.5 | 8.2 | 0.56 |
| 15 | 21 1.4 | 18 46 26.24 | -19 53 39.5 | 12.7 | 12.3 | 0.87 | 33 | 21 30.1 | 22 16 40.67 | -11 9 45.4 | 8.5 | 8.2 | 0.55 |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. |
|--------|--------------------------------|--|---|--------------|----------------|----------------------------------|--------|--------------------------------|--|---|--------------|----------------|----------------------------------|
| | h m | h m s | ° ' " | " | " | s | | h m | h m s | ° ' " | " | " | s |
| Apr. 1 | 21 29.6 | 22 12 9.71 | -11 31 7.6 | 8.5 | 8.2 | 0.56 | May 17 | 21 52.0 | 1 36 3.35 | + 8 3 50.3 | 6.6 | 6.4 | 0.43 |
| 2 | 21 30.1 | 22 16 40.67 | 11 9 45.4 | 8.5 | 8.2 | 0.55 | 18 | 21 52.6 | 1 40 33.37 | 8 29 53.4 | 6.5 | 6.3 | 0.43 |
| 3 | 21 30.7 | 22 21 11.19 | 10 48 3.1 | 8.4 | 8.1 | 0.55 | 19 | 21 53.1 | 1 45 4.05 | 8 55 47.1 | 6.5 | 6.3 | 0.43 |
| 4 | 21 31.2 | 22 25 41.24 | 10 26 1.2 | 8.4 | 8.1 | 0.54 | 20 | 21 53.7 | 1 49 35.43 | 9 21 31.0 | 6.5 | 6.3 | 0.42 |
| 5 | 21 31.8 | 22 30 10.84 | 10 3 40.2 | 8.3 | 8.0 | 0.54 | 21 | 21 54.3 | 1 54 7.54 | 9 47 4.1 | 6.5 | 6.3 | 0.42 |
| 6 | 21 32.3 | 22 34 39.98 | - 9 41 0.8 | 8.2 | 8.0 | 0.54 | 22 | 21 54.9 | 1 58 40.41 | +10 12 26.1 | 6.4 | 6.2 | 0.42 |
| 7 | 21 32.9 | 22 39 8.67 | 9 18 3.5 | 8.2 | 7.9 | 0.53 | 23 | 21 55.5 | 2 3 14.06 | 10 37 36.1 | 6.4 | 6.2 | 0.42 |
| 8 | 21 33.4 | 22 43 36.92 | 8 54 49.1 | 8.1 | 7.8 | 0.53 | 24 | 21 56.1 | 2 7 48.53 | 11 2 33.4 | 6.4 | 6.2 | 0.42 |
| 9 | 21 33.9 | 22 48 4.74 | 8 31 18.2 | 8.1 | 7.8 | 0.53 | 25 | 21 56.7 | 2 12 23.85 | 11 27 17.4 | 6.4 | 6.2 | 0.42 |
| 10 | 21 34.4 | 22 52 32.14 | 8 7 31.3 | 8.0 | 7.7 | 0.52 | 26 | 21 57.4 | 2 17 0.05 | 11 51 47.4 | 6.3 | 6.1 | 0.42 |
| 11 | 21 35.0 | 22 56 59.13 | - 7 43 29.0 | 8.0 | 7.7 | 0.52 | 27 | 21 58.1 | 2 21 37.15 | +12 16 2.6 | 6.3 | 6.1 | 0.42 |
| 12 | 21 35.5 | 23 1 25.72 | 7 19 12.0 | 7.9 | 7.6 | 0.51 | 28 | 21 58.8 | 2 26 15.17 | 12 40 2.3 | 6.3 | 6.1 | 0.41 |
| 13 | 21 36.0 | 23 5 51.92 | 6 54 40.9 | 7.9 | 7.6 | 0.51 | 29 | 21 59.5 | 2 30 54.14 | 13 3 45.9 | 6.2 | 6.0 | 0.41 |
| 14 | 21 36.5 | 23 10 17.76 | 6 29 56.4 | 7.8 | 7.5 | 0.51 | 30 | 22 0.2 | 2 35 34.08 | 13 27 12.8 | 6.2 | 6.0 | 0.41 |
| 15 | 21 37.0 | 23 14 43.26 | 6 4 59.2 | 7.8 | 7.5 | 0.50 | 31 | 22 1.0 | 2 40 15.00 | 13 50 22.1 | 6.2 | 6.0 | 0.41 |
| 16 | 21 37.4 | 23 19 8.45 | - 5 39 49.7 | 7.8 | 7.5 | 0.50 | June 1 | 22 1.8 | 2 44 56.94 | +14 13 13.2 | 6.2 | 6.0 | 0.41 |
| 17 | 21 37.9 | 23 23 33.35 | 5 14 28.5 | 7.7 | 7.4 | 0.50 | 2 | 22 2.6 | 2 49 39.90 | 14 35 45.2 | 6.1 | 6.0 | 0.41 |
| 18 | 21 38.3 | 23 27 57.98 | 4 48 56.3 | 7.7 | 7.4 | 0.49 | 3 | 22 3.4 | 2 54 23.91 | 14 57 57.5 | 6.1 | 5.9 | 0.41 |
| 19 | 21 38.8 | 23 32 22.37 | 4 23 13.7 | 7.6 | 7.3 | 0.49 | 4 | 22 4.2 | 2 59 8.96 | 15 19 49.3 | 6.1 | 5.9 | 0.41 |
| 20 | 21 39.2 | 23 36 46.55 | 3 57 21.3 | 7.6 | 7.3 | 0.49 | 5 | 22 5.0 | 3 3 55.08 | 15 41 20.0 | 6.1 | 5.9 | 0.41 |
| 21 | 21 39.7 | 23 41 10.54 | - 3 31 19.7 | 7.5 | 7.3 | 0.49 | 6 | 22 5.8 | 3 8 42.26 | +16 2 28.7 | 6.1 | 5.9 | 0.41 |
| 22 | 21 40.1 | 23 45 34.37 | 3 5 9.5 | 7.5 | 7.2 | 0.48 | 7 | 22 6.7 | 3 13 30.53 | 16 23 14.9 | 6.0 | 5.9 | 0.41 |
| 23 | 21 40.6 | 23 49 58.07 | 2 38 51.4 | 7.4 | 7.2 | 0.48 | 8 | 22 7.6 | 3 18 19.88 | 16 43 37.7 | 6.0 | 5.8 | 0.41 |
| 24 | 21 41.1 | 23 54 21.66 | 2 12 26.0 | 7.4 | 7.1 | 0.48 | 9 | 22 8.5 | 3 23 10.34 | 17 3 36.6 | 6.0 | 5.8 | 0.40 |
| 25 | 21 41.6 | 23 58 45.18 | 1 45 54.0 | 7.3 | 7.1 | 0.47 | 10 | 22 9.4 | 3 28 1.90 | 17 23 11.0 | 6.0 | 5.8 | 0.40 |
| 26 | 21 42.1 | 0 3 8.66 | - 1 19 15.8 | 7.3 | 7.1 | 0.47 | 11 | 22 10.3 | 3 32 54.58 | +17 42 20.0 | 6.0 | 5.8 | 0.40 |
| 27 | 21 42.6 | 0 7 32.12 | 0 52 32.4 | 7.3 | 7.0 | 0.47 | 12 | 22 11.2 | 3 37 48.36 | 18 1 3.1 | 5.9 | 5.8 | 0.40 |
| 28 | 21 43.0 | 0 11 55.60 | - 0 25 44.2 | 7.2 | 7.0 | 0.46 | 13 | 22 12.2 | 3 42 43.25 | 18 19 19.3 | 5.9 | 5.8 | 0.40 |
| 29 | 21 43.4 | 0 16 19.12 | + 0 1 8.1 | 7.2 | 7.0 | 0.46 | 14 | 22 13.2 | 3 47 39.26 | 18 37 8.1 | 5.9 | 5.7 | 0.40 |
| 30 | 21 43.8 | 0 20 42.71 | 0 28 3.7 | 7.1 | 6.9 | 0.46 | 15 | 22 14.2 | 3 52 36.38 | 18 54 28.8 | 5.9 | 5.7 | 0.40 |
| May 1 | 21 44.2 | 0 25 6.39 | + 0 55 2.2 | 7.1 | 6.9 | 0.46 | 16 | 22 15.2 | 3 57 34.61 | +19 11 20.9 | 5.9 | 5.7 | 0.40 |
| 2 | 21 44.7 | 0 29 30.21 | 1 22 2.9 | 7.1 | 6.8 | 0.46 | 17 | 22 16.3 | 4 2 33.93 | 19 27 43.7 | 5.8 | 5.7 | 0.40 |
| 3 | 21 45.2 | 0 33 54.18 | 1 49 5.1 | 7.0 | 6.8 | 0.45 | 18 | 22 17.3 | 4 7 34.33 | 19 43 36.5 | 5.8 | 5.7 | 0.40 |
| 4 | 21 45.6 | 0 38 18.35 | 2 16 8.0 | 7.0 | 6.8 | 0.45 | 19 | 22 18.4 | 4 12 35.84 | 19 58 58.8 | 5.8 | 5.6 | 0.40 |
| 5 | 21 46.1 | 0 42 42.74 | 2 43 11.0 | 7.0 | 6.7 | 0.45 | 20 | 22 19.5 | 4 17 38.43 | 20 13 50.0 | 5.8 | 5.6 | 0.40 |
| 6 | 21 46.6 | 0 47 7.37 | + 3 10 13.4 | 6.9 | 6.7 | 0.45 | 21 | 22 20.6 | 4 22 42.08 | +20 28 9.3 | 5.8 | 5.6 | 0.40 |
| 7 | 21 47.1 | 0 51 32.28 | 3 37 14.6 | 6.9 | 6.7 | 0.45 | 22 | 22 21.7 | 4 27 46.78 | 20 41 56.2 | 5.8 | 5.6 | 0.40 |
| 8 | 21 47.5 | 0 55 57.49 | 4 4 14.0 | 6.9 | 6.6 | 0.44 | 23 | 22 22.9 | 4 32 52.49 | 20 55 10.3 | 5.7 | 5.6 | 0.40 |
| 9 | 21 48.0 | 1 0 23.03 | 4 31 10.9 | 6.8 | 6.6 | 0.44 | 24 | 22 24.1 | 4 37 59.19 | 21 7 51.0 | 5.7 | 5.6 | 0.40 |
| 10 | 21 48.5 | 1 4 48.94 | 4 58 4.5 | 6.8 | 6.6 | 0.44 | 25 | 22 25.3 | 4 43 6.87 | 21 19 57.5 | 5.7 | 5.5 | 0.40 |
| 11 | 21 49.0 | 1 9 15.25 | + 5 24 54.1 | 6.8 | 6.5 | 0.44 | 26 | 22 26.5 | 4 48 15.50 | +21 31 29.5 | 5.7 | 5.5 | 0.40 |
| 12 | 21 49.5 | 1 13 41.99 | 5 51 38.9 | 6.7 | 6.5 | 0.44 | 27 | 22 27.7 | 4 53 25.07 | 21 42 26.3 | 5.7 | 5.5 | 0.39 |
| 13 | 21 50.0 | 1 18 9.21 | 6 18 18.4 | 6.7 | 6.5 | 0.44 | 28 | 22 28.9 | 4 58 35.53 | 21 52 47.4 | 5.7 | 5.5 | 0.39 |
| 14 | 21 50.5 | 1 22 36.92 | 6 44 51.8 | 6.7 | 6.4 | 0.43 | 29 | 22 30.1 | 5 3 46.86 | 22 2 32.4 | 5.6 | 5.5 | 0.39 |
| 15 | 21 51.0 | 1 27 5.16 | 7 11 18.7 | 6.6 | 6.4 | 0.43 | 30 | 22 31.3 | 5 8 59.00 | 22 11 40.9 | 5.6 | 5.5 | 0.39 |
| 16 | 21 51.5 | 1 31 33.96 | + 7 37 38.4 | 6.6 | 6.4 | 0.43 | 31 | 22 32.6 | 5 14 11.93 | +22 20 12.2 | 5.6 | 5.5 | 0.39 |
| 17 | 21 52.0 | 1 36 3.35 | + 8 3 50.3 | 6.6 | 6.4 | 0.43 | 32 | 22 33.9 | 5 19 25.59 | +22 28 6.0 | 5.6 | 5.4 | 0.39 |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. |
|--------|--------------------------------|--|---|--------------|----------------|----------------------------------|---------|--------------------------------|--|---|--------------|----------------|----------------------------------|
| | h m | h m s | ° ' " | " | " | s | | h m | h m s | ° ' " | " | " | s |
| July 1 | 22 32.6 | 5 14 11.93 | +22 20 12.2 | 5.6 | 5.5 | 0.39 | Aug. 16 | 23 31.1 | 9 14 13.77 | +17 8 2.4 | 5.2 | 5.0 | 0.35 |
| 2 | 22 33.9 | 5 19 25.59 | 22 28 6.0 | 5.6 | 5.4 | 0.39 | 17 | 23 32.1 | 9 19 11.21 | 16 47 11.7 | 5.2 | 5.0 | 0.35 |
| 3 | 22 35.2 | 5 24 39.95 | 22 35 22.0 | 5.6 | 5.4 | 0.39 | 18 | 23 33.1 | 9 24 7.62 | 16 25 52.7 | 5.2 | 5.0 | 0.35 |
| 4 | 22 36.5 | 5 29 54.95 | 22 41 59.6 | 5.6 | 5.4 | 0.39 | 19 | 23 34.1 | 9 29 3.00 | 16 4 6.2 | 5.2 | 5.0 | 0.35 |
| 5 | 22 37.8 | 5 35 10.55 | 22 47 58.7 | 5.6 | 5.4 | 0.39 | 20 | 23 35.1 | 9 33 57.35 | 15 41 52.7 | 5.2 | 5.0 | 0.35 |
| 6 | 22 39.1 | 5 40 26.71 | +22 53 18.7 | 5.5 | 5.4 | 0.39 | 21 | 23 36.0 | 9 38 50.69 | +15 19 12.8 | 5.2 | 5.0 | 0.35 |
| 7 | 22 40.5 | 5 45 43.39 | 22 57 59.6 | 5.5 | 5.4 | 0.39 | 22 | 23 37.0 | 9 43 43.03 | 14 56 7.4 | 5.2 | 5.0 | 0.35 |
| 8 | 22 41.8 | 5 51 0.52 | 23 2 0.9 | 5.5 | 5.3 | 0.39 | 23 | 23 37.9 | 9 48 34.37 | 14 32 37.1 | 5.2 | 5.0 | 0.34 |
| 9 | 22 43.2 | 5 56 18.04 | 23 5 22.4 | 5.5 | 5.3 | 0.39 | 24 | 23 38.8 | 9 53 24.75 | 14 8 42.5 | 5.2 | 5.0 | 0.34 |
| 10 | 22 44.5 | 6 1 35.91 | 23 8 3.7 | 5.5 | 5.3 | 0.39 | 25 | 23 39.7 | 9 58 14.16 | 13 44 24.3 | 5.2 | 5.0 | 0.34 |
| 11 | 22 45.9 | 6 6 54.07 | +23 10 4.9 | 5.5 | 5.3 | 0.38 | 26 | 23 40.5 | 10 3 2.62 | +13 19 43.3 | 5.2 | 5.0 | 0.34 |
| 12 | 22 47.2 | 6 12 12.47 | 23 11 25.8 | 5.5 | 5.3 | 0.38 | 27 | 23 41.4 | 10 7 50.15 | 12 54 40.2 | 5.2 | 5.0 | 0.34 |
| 13 | 22 48.6 | 6 17 31.07 | 23 12 6.3 | 5.5 | 5.3 | 0.38 | 28 | 23 42.2 | 10 12 36.77 | 12 29 15.6 | 5.2 | 5.0 | 0.34 |
| 14 | 22 50.0 | 6 22 49.80 | 23 12 6.0 | 5.5 | 5.3 | 0.38 | 29 | 23 43.0 | 10 17 22.49 | 12 3 30.2 | 5.2 | 5.0 | 0.34 |
| 15 | 22 51.4 | 6 28 8.61 | 23 11 24.9 | 5.4 | 5.3 | 0.38 | 30 | 23 43.8 | 10 22 7.34 | 11 37 24.8 | 5.2 | 5.0 | 0.34 |
| 16 | 22 52.8 | 6 33 27.46 | +23 10 3.1 | 5.4 | 5.2 | 0.38 | 31 | 23 44.6 | 10 26 51.35 | +11 11 0.1 | 5.2 | 5.0 | 0.34 |
| 17 | 22 54.1 | 6 38 46.29 | 23 8 0.7 | 5.4 | 5.2 | 0.38 | Sept. 1 | 23 45.4 | 10 31 34.54 | 10 44 16.8 | 5.2 | 5.0 | 0.34 |
| 18 | 22 55.5 | 6 44 5.04 | 23 5 17.6 | 5.4 | 5.2 | 0.38 | 2 | 23 46.2 | 10 36 16.92 | 10 17 15.7 | 5.2 | 5.0 | 0.34 |
| 19 | 22 56.8 | 6 49 23.69 | 23 1 53.8 | 5.4 | 5.2 | 0.38 | 3 | 23 46.9 | 10 40 58.53 | 9 49 57.6 | 5.1 | 5.0 | 0.34 |
| 20 | 22 58.2 | 6 54 42.13 | 22 57 49.4 | 5.4 | 5.2 | 0.38 | 4 | 23 47.7 | 10 45 39.38 | 9 22 23.2 | 5.1 | 5.0 | 0.34 |
| 21 | 22 59.5 | 7 0 0.36 | +22 53 4.4 | 5.4 | 5.2 | 0.38 | 5 | 23 48.3 | 10 50 19.52 | +8 54 33.3 | 5.1 | 5.0 | 0.34 |
| 22 | 23 0.9 | 7 5 18.31 | 22 47 39.1 | 5.4 | 5.2 | 0.38 | 6 | 23 49.0 | 10 54 58.98 | 8 26 28.6 | 5.1 | 5.0 | 0.33 |
| 23 | 23 2.2 | 7 10 35.94 | 22 41 33.5 | 5.4 | 5.2 | 0.38 | 7 | 23 49.7 | 10 59 37.78 | 7 58 9.7 | 5.1 | 5.0 | 0.33 |
| 24 | 23 3.6 | 7 15 53.20 | 22 34 47.9 | 5.4 | 5.2 | 0.37 | 8 | 23 50.4 | 11 4 15.95 | 7 29 37.5 | 5.1 | 5.0 | 0.33 |
| 25 | 23 4.9 | 7 21 10.03 | 22 27 22.3 | 5.3 | 5.2 | 0.37 | 9 | 23 51.1 | 11 8 53.52 | 7 0 52.7 | 5.1 | 5.0 | 0.33 |
| 26 | 23 6.2 | 7 26 26.40 | +22 19 17.0 | 5.3 | 5.2 | 0.37 | 10 | 23 51.8 | 11 13 30.53 | +6 31 56.0 | 5.1 | 5.0 | 0.33 |
| 27 | 23 7.5 | 7 31 42.24 | 22 10 32.4 | 5.3 | 5.1 | 0.37 | 11 | 23 52.4 | 11 18 7.02 | 6 2 48.1 | 5.1 | 5.0 | 0.33 |
| 28 | 23 8.8 | 7 36 57.53 | 22 1 8.7 | 5.3 | 5.1 | 0.37 | 12 | 23 53.1 | 11 22 43.03 | 5 33 29.8 | 5.1 | 5.0 | 0.33 |
| 29 | 23 10.1 | 7 42 12.21 | 21 51 6.1 | 5.3 | 5.1 | 0.37 | 13 | 23 53.7 | 11 27 18.59 | 5 4 1.8 | 5.1 | 5.0 | 0.33 |
| 30 | 23 11.4 | 7 47 26.24 | 21 40 25.1 | 5.3 | 5.1 | 0.37 | 14 | 23 54.4 | 11 31 53.74 | 4 34 24.7 | 5.1 | 5.0 | 0.33 |
| 31 | 23 12.7 | 7 52 39.59 | +21 29 5.9 | 5.3 | 5.1 | 0.37 | 15 | 23 55.0 | 11 36 28.53 | +4 4 39.5 | 5.1 | 5.0 | 0.33 |
| Aug. 1 | 23 14.0 | 7 57 52.20 | 21 17 9.1 | 5.3 | 5.1 | 0.37 | 16 | 23 55.7 | 11 41 3.00 | 3 34 46.8 | 5.1 | 5.0 | 0.33 |
| 2 | 23 15.2 | 8 3 4.05 | 21 4 34.9 | 5.3 | 5.1 | 0.36 | 17 | 23 56.3 | 11 45 37.17 | 3 4 47.2 | 5.1 | 5.0 | 0.33 |
| 3 | 23 16.5 | 8 8 15.09 | 20 51 24.0 | 5.3 | 5.1 | 0.36 | 18 | 23 56.9 | 11 50 11.11 | 2 34 41.6 | 5.1 | 5.0 | 0.33 |
| 4 | 23 17.7 | 8 13 25.29 | 20 37 36.7 | 5.3 | 5.1 | 0.36 | 19 | 23 57.5 | 11 54 44.85 | 2 4 30.5 | 5.1 | 5.0 | 0.33 |
| 5 | 23 18.9 | 8 18 34.63 | +20 23 13.4 | 5.3 | 5.1 | 0.36 | 20 | 23 58.1 | 11 59 18.44 | +1 34 14.8 | 5.1 | 5.0 | 0.33 |
| 6 | 23 20.1 | 8 23 43.08 | 20 8 14.7 | 5.3 | 5.1 | 0.36 | 21 | 23 58.7 | 12 3 51.92 | 1 3 55.1 | 5.1 | 5.0 | 0.33 |
| 7 | 23 21.3 | 8 28 50.60 | 19 52 41.2 | 5.2 | 5.1 | 0.36 | 22 | 23 59.3 | 12 8 25.32 | 0 33 32.2 | 5.1 | 5.0 | 0.33 |
| 8 | 23 22.5 | 8 33 57.18 | 19 36 33.3 | 5.2 | 5.1 | 0.36 | 24 | 0 0.0 | 12 12 58.68 | +0 3 6.8 | 5.1 | 5.0 | 0.33 |
| 9 | 23 23.6 | 8 39 2.78 | 19 19 51.6 | 5.2 | 5.1 | 0.36 | 25 | 0 0.6 | 12 17 32.06 | -0 27 20.4 | 5.1 | 5.0 | 0.33 |
| 10 | 23 24.7 | 8 44 7.40 | +19 2 36.6 | 5.2 | 5.1 | 0.36 | 26 | 0 1.2 | 12 22 5.50 | -0 57 48.5 | 5.1 | 5.0 | 0.33 |
| 11 | 23 25.8 | 8 49 11.03 | 18 44 45.9 | 5.2 | 5.0 | 0.36 | 27 | 0 1.8 | 12 26 39.06 | 1 28 16.9 | 5.1 | 5.0 | 0.33 |
| 12 | 23 26.9 | 8 54 13.64 | 18 26 29.2 | 5.2 | 5.0 | 0.35 | 28 | 0 2.5 | 12 31 12.74 | 1 58 44.9 | 5.1 | 5.0 | 0.33 |
| 13 | 23 28.0 | 8 59 15.23 | 18 7 38.1 | 5.2 | 5.0 | 0.35 | 29 | 0 3.1 | 12 35 46.61 | 2 29 11.7 | 5.2 | 5.0 | 0.33 |
| 14 | 23 29.0 | 9 4 15.78 | 17 48 16.2 | 5.2 | 5.0 | 0.35 | 30 | 0 3.7 | 12 40 20.70 | 2 59 36.4 | 5.2 | 5.0 | 0.33 |
| 15 | 23 30.1 | 9 9 15.30 | +17 28 24.1 | 5.2 | 5.0 | 0.35 | 31 | 0 4.3 | 12 44 55.05 | -3 29 58.4 | 5.2 | 5.0 | 0.33 |
| 16 | 23 31.1 | 9 14 13.77 | +17 8 2.4 | 5.2 | 5.0 | 0.35 | 32 | 0 5.0 | 12 49 29.71 | -4 0 16.9 | 5.2 | 5.0 | 0.33 |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. |
|--------|--------------------------------|--|---|--------------|----------------|----------------------------------|---------|--------------------------------|--|---|--------------|----------------|----------------------------------|
| | h m | h m s | ° ' " | " | " | " | | h m | h m s | ° ' " | " | " | " |
| Oct. 1 | 0 4.3 | 12 44 55.05 | -3 29 58.4 | 5.2 | 5.0 | 0.33 | Nov. 16 | 0 47.8 | 16 29 53.71 | -22 12 59.8 | 5.4 | 5.2 | 0.38 |
| 2 | 0 5.0 | 12 49 29.71 | 4 0 16.9 | 5.2 | 5.0 | 0.33 | 17 | 0 49.2 | 16 35 13.24 | -22 26 33.7 | 5.4 | 5.2 | 0.38 |
| 3 | 0 5.6 | 12 54 4.72 | 4 30 31.1 | 5.2 | 5.0 | 0.33 | 18 | 0 50.6 | 16 40 33.79 | -22 39 28.4 | 5.4 | 5.2 | 0.38 |
| 4 | 0 6.2 | 12 58 40.11 | 5 0 40.3 | 5.2 | 5.0 | 0.33 | 19 | 0 52.0 | 16 45 55.30 | -22 51 43.1 | 5.4 | 5.3 | 0.38 |
| 5 | 0 6.9 | 13 3 15.93 | 5 30 43.8 | 5.2 | 5.0 | 0.33 | 20 | 0 53.4 | 16 51 17.75 | -23 3 17.4 | 5.4 | 5.3 | 0.38 |
| 6 | 0 7.5 | 13 7 52.21 | -6 0 40.7 | 5.2 | 5.0 | 0.33 | 21 | 0 54.9 | 16 56 41.09 | -23 14 10.6 | 5.5 | 5.3 | 0.38 |
| 7 | 0 8.2 | 13 12 28.99 | 6 30 30.2 | 5.2 | 5.0 | 0.33 | 22 | 0 56.3 | 17 2 5.29 | -23 24 22.3 | 5.5 | 5.3 | 0.38 |
| 8 | 0 8.9 | 13 17 6.31 | 7 0 11.6 | 5.2 | 5.0 | 0.33 | 23 | 0 57.8 | 17 7 30.29 | -23 33 52.1 | 5.5 | 5.3 | 0.39 |
| 9 | 0 9.6 | 13 21 44.21 | 7 29 44.1 | 5.2 | 5.0 | 0.34 | 24 | 0 59.3 | 17 12 56.05 | -23 42 39.4 | 5.5 | 5.3 | 0.39 |
| 10 | 0 10.3 | 13 26 22.73 | 7 59 6.9 | 5.2 | 5.0 | 0.34 | 25 | 1 0.8 | 17 18 22.50 | -23 50 44.0 | 5.5 | 5.3 | 0.39 |
| 11 | 0 11.0 | 13 31 1.90 | -8 28 19.2 | 5.2 | 5.0 | 0.34 | 26 | 1 2.3 | 17 23 49.59 | -23 58 5.3 | 5.5 | 5.3 | 0.39 |
| 12 | 0 11.7 | 13 35 41.77 | 8 57 20.2 | 5.2 | 5.0 | 0.34 | 27 | 1 3.8 | 17 29 17.28 | -24 4 43.0 | 5.5 | 5.3 | 0.39 |
| 13 | 0 12.5 | 13 40 22.40 | 9 26 9.2 | 5.2 | 5.0 | 0.34 | 28 | 1 5.3 | 17 34 45.49 | -24 10 36.8 | 5.5 | 5.3 | 0.39 |
| 14 | 0 13.3 | 13 45 3.80 | 9 54 45.4 | 5.2 | 5.0 | 0.34 | 29 | 1 6.8 | 17 40 14.16 | -24 15 46.3 | 5.5 | 5.3 | 0.39 |
| 15 | 0 14.1 | 13 49 46.00 | 10 23 7.9 | 5.2 | 5.0 | 0.34 | 30 | 1 8.3 | 17 45 43.23 | -24 20 11.2 | 5.5 | 5.4 | 0.39 |
| 16 | 0 14.8 | 13 54 29.05 | -10 51 16.2 | 5.2 | 5.0 | 0.34 | Dec. 1 | 1 9.9 | 17 51 12.63 | -24 23 51.3 | 5.6 | 5.4 | 0.39 |
| 17 | 0 15.6 | 13 59 12.98 | 11 19 9.4 | 5.2 | 5.0 | 0.34 | 2 | 1 11.4 | 17 56 42.28 | -24 26 46.5 | 5.6 | 5.4 | 0.39 |
| 18 | 0 16.4 | 14 3 57.83 | 11 46 46.7 | 5.2 | 5.0 | 0.34 | 3 | 1 13.0 | 18 2 12.14 | -24 28 56.6 | 5.6 | 5.4 | 0.40 |
| 19 | 0 17.2 | 14 8 43.63 | 12 14 7.3 | 5.2 | 5.0 | 0.34 | 4 | 1 14.5 | 18 7 42.12 | -24 30 21.4 | 5.6 | 5.4 | 0.40 |
| 20 | 0 18.0 | 14 13 30.43 | 12 41 10.5 | 5.2 | 5.0 | 0.34 | 5 | 1 16.1 | 18 13 12.15 | -24 31 0.7 | 5.6 | 5.4 | 0.40 |
| 21 | 0 18.8 | 14 18 18.24 | -13 7 55.3 | 5.2 | 5.0 | 0.35 | 6 | 1 17.6 | 18 18 42.18 | -24 30 54.7 | 5.6 | 5.4 | 0.40 |
| 22 | 0 19.7 | 14 23 7.09 | 13 34 21.2 | 5.2 | 5.1 | 0.35 | 7 | 1 19.2 | 18 24 12.11 | -24 30 3.4 | 5.6 | 5.4 | 0.40 |
| 23 | 0 20.6 | 14 27 57.01 | 14 0 27.2 | 5.2 | 5.1 | 0.35 | 8 | 1 20.7 | 18 29 41.89 | -24 28 26.5 | 5.6 | 5.5 | 0.40 |
| 24 | 0 21.5 | 14 32 48.05 | 14 26 12.6 | 5.3 | 5.1 | 0.35 | 9 | 1 22.3 | 18 35 11.42 | -24 26 4.2 | 5.7 | 5.5 | 0.40 |
| 25 | 0 22.4 | 14 37 40.21 | 14 51 36.5 | 5.3 | 5.1 | 0.35 | 10 | 1 23.8 | 18 40 40.65 | -24 22 56.8 | 5.7 | 5.5 | 0.40 |
| 26 | 0 23.4 | 14 42 33.52 | -15 16 38.2 | 5.3 | 5.1 | 0.35 | 11 | 1 25.4 | 18 46 9.52 | -24 19 4.5 | 5.7 | 5.5 | 0.40 |
| 27 | 0 24.3 | 14 47 28.00 | 15 41 16.8 | 5.3 | 5.1 | 0.35 | 12 | 1 26.9 | 18 51 37.96 | -24 14 27.2 | 5.7 | 5.5 | 0.40 |
| 28 | 0 25.3 | 14 52 23.67 | 16 5 31.4 | 5.3 | 5.1 | 0.35 | 13 | 1 28.5 | 18 57 5.92 | -24 9 5.1 | 5.7 | 5.5 | 0.40 |
| 29 | 0 26.3 | 14 57 20.55 | 16 29 21.5 | 5.3 | 5.1 | 0.35 | 14 | 1 30.0 | 19 2 33.31 | -24 2 58.6 | 5.7 | 5.5 | 0.40 |
| 30 | 0 27.3 | 15 2 18.64 | 16 52 46.1 | 5.3 | 5.1 | 0.36 | 15 | 1 31.5 | 19 8 0.08 | -23 56 7.8 | 5.7 | 5.5 | 0.40 |
| 31 | 0 28.4 | 15 7 17.96 | -17 15 44.4 | 5.3 | 5.1 | 0.36 | 16 | 1 33.0 | 19 13 26.19 | -23 48 33.2 | 5.8 | 5.6 | 0.41 |
| Nov. 1 | 0 29.4 | 15 12 18.52 | 17 38 15.6 | 5.3 | 5.1 | 0.36 | 17 | 1 34.4 | 19 18 51.57 | -23 40 15.0 | 5.8 | 5.6 | 0.41 |
| 2 | 0 30.5 | 15 17 20.32 | 18 0 18.9 | 5.3 | 5.1 | 0.36 | 18 | 1 35.9 | 19 24 16.16 | -23 31 13.5 | 5.8 | 5.6 | 0.41 |
| 3 | 0 31.6 | 15 22 23.37 | 18 21 53.3 | 5.3 | 5.1 | 0.36 | 19 | 1 37.3 | 19 29 39.91 | -23 21 29.2 | 5.8 | 5.6 | 0.41 |
| 4 | 0 32.7 | 15 27 27.67 | 18 42 58.2 | 5.3 | 5.1 | 0.36 | 20 | 1 38.8 | 19 35 2.79 | -23 11 2.4 | 5.8 | 5.6 | 0.41 |
| 5 | 0 33.9 | 15 32 33.22 | -19 3 32.9 | 5.3 | 5.1 | 0.36 | 21 | 1 40.2 | 19 40 24.72 | -22 59 53.6 | 5.8 | 5.6 | 0.41 |
| 6 | 0 35.1 | 15 37 40.01 | 19 23 36.5 | 5.3 | 5.2 | 0.36 | 22 | 1 41.6 | 19 45 45.66 | -22 48 3.4 | 5.8 | 5.6 | 0.41 |
| 7 | 0 36.3 | 15 42 48.04 | 19 43 8.2 | 5.3 | 5.2 | 0.36 | 23 | 1 43.0 | 19 51 5.57 | -22 35 32.3 | 5.9 | 5.7 | 0.41 |
| 8 | 0 37.5 | 15 47 57.29 | 20 2 7.3 | 5.3 | 5.2 | 0.37 | 24 | 1 44.4 | 19 56 24.40 | -22 22 20.7 | 5.9 | 5.7 | 0.41 |
| 9 | 0 38.7 | 15 53 7.75 | 20 20 33.1 | 5.3 | 5.2 | 0.37 | 25 | 1 45.7 | 20 1 42.14 | -22 8 29.1 | 5.9 | 5.7 | 0.41 |
| 10 | 0 39.9 | 15 58 19.43 | -20 38 24.9 | 5.4 | 5.2 | 0.37 | 26 | 1 47.1 | 20 6 58.74 | -21 53 58.1 | 5.9 | 5.7 | 0.41 |
| 11 | 0 41.2 | 16 3 32.29 | 20 55 41.8 | 5.4 | 5.2 | 0.37 | 27 | 1 48.4 | 20 12 14.15 | -21 38 48.3 | 5.9 | 5.7 | 0.41 |
| 12 | 0 42.5 | 16 8 46.33 | 21 12 23.1 | 5.4 | 5.2 | 0.37 | 28 | 1 49.7 | 20 17 28.34 | -21 23 0.3 | 5.9 | 5.7 | 0.41 |
| 13 | 0 43.8 | 16 14 1.52 | 21 28 28.2 | 5.4 | 5.2 | 0.37 | 29 | 1 51.0 | 20 22 41.28 | -21 6 34.8 | 6.0 | 5.8 | 0.41 |
| 14 | 0 45.1 | 16 19 17.82 | 21 43 56.5 | 5.4 | 5.2 | 0.38 | 30 | 1 52.2 | 20 27 52.96 | -20 49 32.4 | 6.0 | 5.8 | 0.41 |
| 15 | 0 46.5 | 16 24 35.23 | -21 58 47.2 | 5.4 | 5.2 | 0.38 | 31 | 1 53.4 | 20 33 3.35 | -20 31 53.5 | 6.0 | 5.8 | 0.41 |
| 16 | 0 47.8 | 16 29 53.71 | -22 12 59.8 | 5.4 | 5.2 | 0.38 | 32 | 1 54.6 | 20 38 12.41 | -20 13 39.9 | 6.0 | 5.8 | 0.41 |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Polar Semi- diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Polar Semi- diam. | S.T. of Sem. Pass. Mer. |
|--------|--------------------------------|--|---|--------------|-------------------------|----------------------------------|---------|--------------------------------|--|---|--------------|-------------------------|----------------------------------|
| | h m | h m s | ° ' " | " | " | s | | h m | h m s | ° ' " | " | " | s |
| June 1 | 18 27.8 | 23 10 26.72 | -6 29 22.5 | 1.8 | 18.9 | 1.35 | July 17 | 15 33.8 | 23 17 18.69 | -6 0 40.3 | 2.0 | 21.8 | 1.56 |
| 2 | 18 24.3 | 23 10 50.40 | 6 27 11.1 | 1.8 | 18.9 | 1.35 | 18 | 15 29.8 | 23 17 11.21 | 6 1 46.8 | 2.1 | 21.9 | 1.56 |
| 3 | 18 20.7 | 23 11 13.48 | 6 25 3.5 | 1.8 | 19.0 | 1.36 | 19 | 15 25.7 | 23 17 3.03 | 6 2 57.7 | 2.1 | 22.0 | 1.57 |
| 4 | 18 17.2 | 23 11 35.98 | 6 22 59.6 | 1.8 | 19.0 | 1.36 | 20 | 15 21.6 | 23 16 54.14 | 6 4 12.8 | 2.1 | 22.0 | 1.57 |
| 5 | 18 13.6 | 23 11 57.87 | 6 20 59.5 | 1.8 | 19.1 | 1.36 | 21 | 15 17.5 | 23 16 44.57 | 6 5 32.2 | 2.1 | 22.1 | 1.58 |
| 6 | 18 10.0 | 23 12 19.16 | -6 19 3.4 | 1.8 | 19.1 | 1.37 | 22 | 15 13.4 | 23 16 34.30 | -6 6 55.9 | 2.1 | 22.1 | 1.58 |
| 7 | 18 6.4 | 23 12 39.84 | 6 17 11.1 | 1.8 | 19.2 | 1.37 | 23 | 15 9.3 | 23 16 23.35 | 6 8 23.8 | 2.1 | 22.2 | 1.58 |
| 8 | 18 2.8 | 23 12 59.90 | 6 15 22.7 | 1.8 | 19.3 | 1.38 | 24 | 15 5.2 | 23 16 11.71 | 6 9 55.8 | 2.1 | 22.2 | 1.59 |
| 9 | 17 59.2 | 23 13 19.34 | 6 13 38.4 | 1.8 | 19.3 | 1.38 | 25 | 15 1.0 | 23 15 59.39 | 6 11 32.0 | 2.1 | 22.3 | 1.59 |
| 10 | 17 55.6 | 23 13 38.16 | 6 11 58.0 | 1.8 | 19.4 | 1.39 | 26 | 14 56.9 | 23 15 46.40 | 6 13 12.2 | 2.1 | 22.4 | 1.60 |
| 11 | 17 52.0 | 23 13 56.34 | -6 10 21.7 | 1.8 | 19.5 | 1.39 | 27 | 14 52.8 | 23 15 32.76 | -6 14 56.4 | 2.1 | 22.4 | 1.60 |
| 12 | 17 48.4 | 23 14 13.89 | 6 8 49.4 | 1.8 | 19.5 | 1.40 | 28 | 14 48.6 | 23 15 18.44 | 6 16 44.6 | 2.1 | 22.5 | 1.61 |
| 13 | 17 44.7 | 23 14 30.81 | 6 7 21.3 | 1.8 | 19.6 | 1.40 | 29 | 14 44.4 | 23 15 3.47 | 6 18 36.7 | 2.1 | 22.5 | 1.61 |
| 14 | 17 41.0 | 23 14 47.07 | 6 5 57.2 | 1.8 | 19.7 | 1.41 | 30 | 14 40.2 | 23 14 47.85 | 6 20 32.7 | 2.1 | 22.6 | 1.61 |
| 15 | 17 37.4 | 23 15 2.69 | 6 4 37.3 | 1.8 | 19.8 | 1.41 | 31 | 14 36.0 | 23 14 31.60 | 6 22 32.5 | 2.1 | 22.6 | 1.62 |
| 16 | 17 33.7 | 23 15 17.67 | -6 3 21.6 | 1.9 | 19.8 | 1.41 | Aug. 1 | 14 31.8 | 23 14 14.70 | -6 24 36.0 | 2.1 | 22.7 | 1.62 |
| 17 | 17 30.0 | 23 15 31.98 | 6 2 10.1 | 1.9 | 19.9 | 1.42 | 2 | 14 27.6 | 23 13 57.19 | 6 26 43.1 | 2.1 | 22.7 | 1.63 |
| 18 | 17 26.3 | 23 15 45.64 | 6 1 2.8 | 1.9 | 19.9 | 1.42 | 3 | 14 23.3 | 23 13 39.06 | 6 28 53.8 | 2.1 | 22.8 | 1.63 |
| 19 | 17 22.6 | 23 15 58.63 | 5 59 59.8 | 1.9 | 20.0 | 1.43 | 4 | 14 19.1 | 23 13 20.36 | 6 31 8.0 | 2.1 | 22.8 | 1.63 |
| 20 | 17 18.8 | 23 16 10.96 | 5 59 1.0 | 1.9 | 20.1 | 1.43 | 5 | 14 14.9 | 23 13 1.06 | 6 33 25.6 | 2.1 | 22.9 | 1.64 |
| 21 | 17 15.1 | 23 16 22.61 | -5 58 6.6 | 1.9 | 20.1 | 1.44 | 6 | 14 10.6 | 23 12 41.18 | -6 35 46.5 | 2.2 | 22.9 | 1.64 |
| 22 | 17 11.4 | 23 16 33.59 | 5 57 16.4 | 1.9 | 20.2 | 1.44 | 7 | 14 6.3 | 23 12 20.74 | 6 38 10.7 | 2.2 | 23.0 | 1.64 |
| 23 | 17 7.6 | 23 16 43.88 | 5 56 30.6 | 1.9 | 20.3 | 1.45 | 8 | 14 2.0 | 23 11 59.76 | 6 40 38.0 | 2.2 | 23.0 | 1.65 |
| 24 | 17 3.8 | 23 16 53.50 | 5 55 49.2 | 1.9 | 20.3 | 1.45 | 9 | 13 57.7 | 23 11 38.24 | 6 43 8.3 | 2.2 | 23.1 | 1.65 |
| 25 | 17 0.0 | 23 17 2.42 | 5 55 12.2 | 1.9 | 20.4 | 1.46 | 10 | 13 53.4 | 23 11 16.20 | 6 45 41.5 | 2.2 | 23.1 | 1.65 |
| 26 | 16 56.2 | 23 17 10.65 | -5 54 39.6 | 1.9 | 20.4 | 1.46 | 11 | 13 49.1 | 23 10 53.65 | -6 48 17.5 | 2.2 | 23.1 | 1.65 |
| 27 | 16 52.4 | 23 17 18.18 | 5 54 11.5 | 1.9 | 20.5 | 1.47 | 12 | 13 44.8 | 23 10 30.62 | 6 50 56.2 | 2.2 | 23.2 | 1.66 |
| 28 | 16 48.6 | 23 17 25.02 | 5 53 47.8 | 1.9 | 20.6 | 1.47 | 13 | 13 40.5 | 23 10 7.12 | 6 53 37.4 | 2.2 | 23.2 | 1.66 |
| 29 | 16 44.8 | 23 17 31.14 | 5 53 28.6 | 1.9 | 20.6 | 1.48 | 14 | 13 36.2 | 23 9 43.15 | 6 56 21.1 | 2.2 | 23.3 | 1.66 |
| 30 | 16 41.0 | 23 17 36.56 | 5 53 13.9 | 1.9 | 20.7 | 1.48 | 15 | 13 31.8 | 23 9 18.74 | 6 59 7.2 | 2.2 | 23.3 | 1.67 |
| July 1 | 16 37.1 | 23 17 41.26 | -5 53 3.8 | 1.9 | 20.8 | 1.49 | 16 | 13 27.5 | 23 8 53.91 | -7 1 55.5 | 2.2 | 23.3 | 1.67 |
| 2 | 16 33.2 | 23 17 45.25 | 5 52 58.2 | 2.0 | 20.9 | 1.49 | 17 | 13 23.1 | 23 8 28.67 | 7 4 45.9 | 2.2 | 23.4 | 1.67 |
| 3 | 16 29.4 | 23 17 48.52 | 5 52 57.2 | 2.0 | 20.9 | 1.50 | 18 | 13 18.8 | 23 8 3.03 | 7 7 38.3 | 2.2 | 23.4 | 1.68 |
| 4 | 16 25.5 | 23 17 51.07 | 5 53 0.8 | 2.0 | 21.0 | 1.50 | 19 | 13 14.4 | 23 7 37.01 | 7 10 32.7 | 2.2 | 23.4 | 1.68 |
| 5 | 16 21.6 | 23 17 52.90 | 5 53 8.9 | 2.0 | 21.0 | 1.50 | 20 | 13 10.1 | 23 7 10.64 | 7 13 28.8 | 2.2 | 23.5 | 1.68 |
| 6 | 16 17.7 | 23 17 54.01 | -5 53 21.6 | 2.0 | 21.1 | 1.51 | 21 | 13 5.7 | 23 6 43.91 | -7 16 26.5 | 2.2 | 23.5 | 1.68 |
| 7 | 16 13.7 | 23 17 54.40 | 5 53 38.8 | 2.0 | 21.2 | 1.51 | 22 | 13 1.3 | 23 6 16.86 | 7 19 25.8 | 2.2 | 23.5 | 1.68 |
| 8 | 16 9.8 | 23 17 54.06 | 5 54 0.7 | 2.0 | 21.2 | 1.52 | 23 | 12 56.9 | 23 5 49.51 | 7 22 26.5 | 2.2 | 23.5 | 1.68 |
| 9 | 16 5.8 | 23 17 53.00 | 5 54 27.1 | 2.0 | 21.3 | 1.52 | 24 | 12 52.5 | 23 5 21.87 | 7 25 28.5 | 2.2 | 23.6 | 1.69 |
| 10 | 16 1.9 | 23 17 51.21 | 5 54 58.1 | 2.0 | 21.4 | 1.53 | 25 | 12 48.1 | 23 4 53.95 | 7 28 31.7 | 2.2 | 23.6 | 1.69 |
| 11 | 15 57.9 | 23 17 48.71 | -5 55 33.5 | 2.0 | 21.4 | 1.53 | 26 | 12 43.7 | 23 4 25.78 | -7 31 35.8 | 2.2 | 23.6 | 1.69 |
| 12 | 15 53.9 | 23 17 45.49 | 5 56 13.5 | 2.0 | 21.5 | 1.54 | 27 | 12 39.3 | 23 3 57.39 | 7 34 40.8 | 2.2 | 23.6 | 1.69 |
| 13 | 15 49.9 | 23 17 41.56 | 5 56 58.0 | 2.0 | 21.6 | 1.54 | 28 | 12 34.9 | 23 3 28.77 | 7 37 46.7 | 2.2 | 23.6 | 1.69 |
| 14 | 15 45.9 | 23 17 36.91 | 5 57 46.9 | 2.0 | 21.6 | 1.55 | 29 | 12 30.5 | 23 2 59.96 | 7 40 53.2 | 2.2 | 23.7 | 1.69 |
| 15 | 15 41.9 | 23 17 31.55 | 5 58 40.3 | 2.0 | 21.7 | 1.55 | 30 | 12 26.1 | 23 2 30.99 | 7 44 0.2 | 2.2 | 23.7 | 1.69 |
| 16 | 15 37.8 | 23 17 25.47 | -5 59 38.1 | 2.0 | 21.8 | 1.56 | 31 | 12 21.7 | 23 2 1.88 | -7 47 7.5 | 2.2 | 23.7 | 1.70 |
| 17 | 15 33.8 | 23 17 18.69 | -6 0 40.3 | 2.0 | 21.8 | 1.56 | Sept. 1 | 12 17.2 | 23 1 32.65 | -7 50 15.0 | 2.2 | 23.7 | 1.70 |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Polar Semi- diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Polar Semi- diam. | S.T. of Sem. Pass. Mer. |
|---------|--------------------------------|--|---|--------------|-------------------------|----------------------------------|---------|--------------------------------|--|---|--------------|-------------------------|----------------------------------|
| | h m | h m s | ° ' " | " | " | s | | h m | h m s | ° ' " | " | " | s |
| Sept. 1 | 12 17.2 | 23 1 32.65 | -7 50 15.0 | 2.2 | 23.7 | 1.70 | Oct. 17 | 8 57.9 | 22 43 2.77 | -9 40 21.6 | 2.1 | 22.3 | 1.61 |
| 2 | 12 12.8 | 23 1 3.30 | 7 53 22.5 | 2.2 | 23.7 | 1.70 | 18 | 8 53.8 | 22 42 50.50 | 9 41 23.8 | 2.1 | 22.2 | 1.61 |
| 3 | 12 8.4 | 23 0 33.89 | 7 56 30.0 | 2.2 | 23.7 | 1.70 | 19 | 8 49.7 | 22 42 38.94 | 9 42 21.4 | 2.1 | 22.2 | 1.60 |
| 4 | 12 4.0 | 23 0 4.44 | 7 59 37.2 | 2.2 | 23.7 | 1.70 | 20 | 8 45.6 | 22 42 28.09 | 9 43 14.6 | 2.1 | 22.1 | 1.60 |
| 5 | 11 59.5 | 22 59 34.94 | 8 2 44.0 | 2.2 | 23.7 | 1.70 | 21 | 8 41.5 | 22 42 17.07 | 9 44 3.2 | 2.1 | 22.1 | 1.59 |
| 6 | 11 55.1 | 22 59 5.43 | -8 5 50.2 | 2.2 | 23.7 | 1.70 | 22 | 8 37.4 | 22 42 8.57 | -9 44 47.3 | 2.1 | 22.0 | 1.59 |
| 7 | 11 50.7 | 22 58 35.94 | 8 8 55.7 | 2.2 | 23.7 | 1.70 | 23 | 8 33.3 | 22 41 59.90 | 9 45 26.9 | 2.1 | 21.9 | 1.58 |
| 8 | 11 46.2 | 22 58 6.49 | 8 12 0.5 | 2.2 | 23.7 | 1.70 | 24 | 8 29.2 | 22 41 51.97 | 9 46 1.8 | 2.1 | 21.9 | 1.58 |
| 9 | 11 41.8 | 22 57 37.09 | 8 15 4.2 | 2.2 | 23.7 | 1.70 | 25 | 8 25.2 | 22 41 44.79 | 9 46 32.1 | 2.1 | 21.8 | 1.57 |
| 10 | 11 37.4 | 22 57 7.78 | 8 18 6.8 | 2.2 | 23.7 | 1.70 | 26 | 8 21.2 | 22 41 38.36 | 9 46 57.8 | 2.1 | 21.7 | 1.57 |
| 11 | 11 33.0 | 22 56 38.58 | -8 21 8.2 | 2.2 | 23.6 | 1.70 | 27 | 8 17.1 | 22 41 32.68 | -9 47 18.8 | 2.0 | 21.7 | 1.56 |
| 12 | 11 28.6 | 22 56 9.50 | 8 24 8.2 | 2.2 | 23.6 | 1.70 | 28 | 8 13.1 | 22 41 27.76 | 9 47 35.1 | 2.0 | 21.6 | 1.56 |
| 13 | 11 24.2 | 22 55 40.58 | 8 27 6.7 | 2.2 | 23.6 | 1.70 | 29 | 8 9.1 | 22 41 23.61 | 9 47 46.8 | 2.0 | 21.5 | 1.55 |
| 14 | 11 19.8 | 22 55 11.83 | 8 30 3.5 | 2.2 | 23.6 | 1.70 | 30 | 8 5.1 | 22 41 20.22 | 9 47 53.8 | 2.0 | 21.5 | 1.55 |
| 15 | 11 15.4 | 22 54 43.27 | 8 32 58.6 | 2.2 | 23.6 | 1.70 | 31 | 8 1.1 | 22 41 17.59 | 9 47 56.2 | 2.0 | 21.4 | 1.54 |
| 16 | 11 11.0 | 22 54 14.91 | -8 35 51.8 | 2.2 | 23.5 | 1.70 | Nov. 1 | 7 57.2 | 22 41 15.74 | -9 47 53.8 | 2.0 | 21.4 | 1.54 |
| 17 | 11 6.6 | 22 53 46.79 | 8 38 43.0 | 2.2 | 23.5 | 1.69 | 2 | 7 53.2 | 22 41 14.66 | 9 47 46.7 | 2.0 | 21.3 | 1.53 |
| 18 | 11 2.2 | 22 53 18.92 | 8 41 32.1 | 2.2 | 23.5 | 1.69 | 3 | 7 49.3 | 22 41 14.34 | 9 47 34.9 | 2.0 | 21.2 | 1.53 |
| 19 | 10 57.8 | 22 52 51.32 | 8 44 18.9 | 2.2 | 23.5 | 1.69 | 4 | 7 45.4 | 22 41 14.80 | 9 47 18.4 | 2.0 | 21.2 | 1.52 |
| 20 | 10 53.4 | 22 52 24.01 | 8 47 3.4 | 2.2 | 23.5 | 1.69 | 5 | 7 41.5 | 22 41 16.03 | 9 46 57.2 | 2.0 | 21.1 | 1.52 |
| 21 | 10 49.0 | 22 51 57.01 | -8 49 45.5 | 2.2 | 23.4 | 1.69 | 6 | 7 37.6 | 22 41 18.03 | -9 46 31.4 | 2.0 | 21.0 | 1.51 |
| 22 | 10 44.6 | 22 51 30.35 | 8 52 25.0 | 2.2 | 23.4 | 1.69 | 7 | 7 33.7 | 22 41 20.80 | 9 46 0.9 | 2.0 | 21.0 | 1.51 |
| 23 | 10 40.3 | 22 51 4.02 | 8 55 1.9 | 2.2 | 23.4 | 1.69 | 8 | 7 29.8 | 22 41 24.34 | 9 45 25.8 | 2.0 | 20.9 | 1.50 |
| 24 | 10 35.9 | 22 50 38.07 | 8 57 36.0 | 2.2 | 23.4 | 1.69 | 9 | 7 25.9 | 22 41 28.65 | 9 44 46.1 | 2.0 | 20.8 | 1.50 |
| 25 | 10 31.6 | 22 50 12.51 | 9 0 7.1 | 2.2 | 23.3 | 1.68 | 10 | 7 22.1 | 22 41 33.72 | 9 44 1.8 | 2.0 | 20.8 | 1.50 |
| 26 | 10 27.2 | 22 49 47.35 | -9 2 35.3 | 2.2 | 23.3 | 1.68 | 11 | 7 18.3 | 22 41 39.55 | -9 43 12.8 | 2.0 | 20.7 | 1.49 |
| 27 | 10 22.9 | 22 49 22.62 | 9 5 0.5 | 2.2 | 23.3 | 1.68 | 12 | 7 14.4 | 22 41 46.14 | 9 42 19.3 | 1.9 | 20.6 | 1.49 |
| 28 | 10 18.5 | 22 48 58.32 | 9 7 22.5 | 2.2 | 23.2 | 1.67 | 13 | 7 10.6 | 22 41 53.47 | 9 41 21.3 | 1.9 | 20.6 | 1.48 |
| 29 | 10 14.2 | 22 48 34.50 | 9 9 41.1 | 2.2 | 23.2 | 1.67 | 14 | 7 6.8 | 22 42 1.55 | 9 40 18.8 | 1.9 | 20.5 | 1.48 |
| 30 | 10 9.9 | 22 48 11.16 | 9 11 56.3 | 2.2 | 23.2 | 1.67 | 15 | 7 3.0 | 22 42 10.37 | 9 39 11.8 | 1.9 | 20.4 | 1.47 |
| Oct. 1 | 10 5.6 | 22 47 48.32 | -9 14 8.1 | 2.2 | 23.1 | 1.66 | 16 | 6 59.3 | 22 42 19.94 | -9 38 0.3 | 1.9 | 20.4 | 1.47 |
| 2 | 10 1.3 | 22 47 25.99 | 9 16 16.2 | 2.2 | 23.1 | 1.66 | 17 | 6 55.5 | 22 42 30.24 | 9 36 44.4 | 1.9 | 20.3 | 1.46 |
| 3 | 9 57.0 | 22 47 4.20 | 9 18 20.7 | 2.2 | 23.0 | 1.66 | 18 | 6 51.8 | 22 42 41.28 | 9 35 24.1 | 1.9 | 20.2 | 1.46 |
| 4 | 9 52.7 | 22 46 42.96 | 9 20 21.5 | 2.1 | 23.0 | 1.65 | 19 | 6 48.0 | 22 42 53.05 | 9 33 59.5 | 1.9 | 20.1 | 1.45 |
| 5 | 9 48.4 | 22 46 22.28 | 9 22 18.5 | 2.1 | 22.9 | 1.65 | 20 | 6 44.3 | 22 43 5.54 | 9 32 30.5 | 1.9 | 20.1 | 1.45 |
| 6 | 9 44.1 | 22 46 2.18 | -9 24 11.6 | 2.1 | 22.9 | 1.65 | 21 | 6 40.6 | 22 43 18.75 | -9 30 57.2 | 1.9 | 20.0 | 1.44 |
| 7 | 9 39.9 | 22 45 42.67 | 9 26 0.8 | 2.1 | 22.8 | 1.64 | 22 | 6 36.9 | 22 43 32.68 | 9 29 19.6 | 1.9 | 20.0 | 1.44 |
| 8 | 9 35.6 | 22 45 23.77 | 9 27 45.8 | 2.1 | 22.8 | 1.64 | 23 | 6 33.2 | 22 43 47.32 | 9 27 37.7 | 1.9 | 19.9 | 1.43 |
| 9 | 9 31.4 | 22 45 5.49 | 9 29 26.8 | 2.1 | 22.7 | 1.64 | 24 | 6 29.5 | 22 44 2.67 | 9 25 51.6 | 1.9 | 19.8 | 1.43 |
| 10 | 9 27.2 | 22 44 47.84 | 9 31 3.6 | 2.1 | 22.7 | 1.63 | 25 | 6 25.8 | 22 44 18.72 | 9 24 1.2 | 1.9 | 19.8 | 1.42 |
| 11 | 9 23.0 | 22 44 30.84 | -9 32 36.3 | 2.1 | 22.6 | 1.63 | 26 | 6 22.2 | 22 44 35.47 | -9 22 6.6 | 1.9 | 19.7 | 1.41 |
| 12 | 9 18.8 | 22 44 14.48 | 9 34 4.7 | 2.1 | 22.6 | 1.63 | 27 | 6 18.6 | 22 44 52.92 | 9 20 7.8 | 1.9 | 19.6 | 1.41 |
| 13 | 9 14.6 | 22 43 58.78 | 9 35 28.7 | 2.1 | 22.5 | 1.62 | 28 | 6 14.9 | 22 45 11.05 | 9 18 4.9 | 1.8 | 19.5 | 1.40 |
| 14 | 9 10.4 | 22 43 43.75 | 9 36 48.5 | 2.1 | 22.5 | 1.62 | 29 | 6 11.3 | 22 45 29.86 | 9 15 57.8 | 1.8 | 19.5 | 1.40 |
| 15 | 9 6.2 | 22 43 29.40 | 9 38 3.9 | 2.1 | 22.4 | 1.62 | 30 | 6 7.7 | 22 45 49.36 | 9 13 46.6 | 1.8 | 19.4 | 1.40 |
| 16 | 9 2.1 | 22 43 15.74 | -9 39 15.0 | 2.1 | 22.4 | 1.61 | Dec. 1 | 6 4.1 | 22 46 9.52 | -9 11 31.4 | 1.8 | 19.4 | 1.39 |
| 17 | 8 57.9 | 22 43 2.77 | -9 40 21.6 | 2.1 | 22.3 | 1.61 | 2 | 6 0.5 | 22 46 30.34 | -9 9 12.2 | 1.8 | 19.3 | 1.39 |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Polar Sem. diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Polar Sem. diam. | S.T. of Sem. Pass. Mer. |
|--------|-----------------------|-----------------------------------|----------------------------------|-----------|------------------|-------------------------|---------|-----------------------|-----------------------------------|----------------------------------|-----------|------------------|-------------------------|
| | h m | h m s | ° ' " | " | " | s | | h m | h m s | ° ' " | " | " | s |
| Jan. 0 | 16 32.9 | 11 15 52.54 | +6 53 8.2 | 1.0 | 8.8 | 0.63 | Feb. 15 | 13 24.5 | 11 8 21.70 | +7 51 27.0 | 1.1 | 9.3 | 0.67 |
| 1 | 16 28.9 | 11 15 50.84 | 6 53 36.5 | 1.0 | 8.8 | 0.63 | 16 | 13 20.3 | 11 8 5.38 | 7 53 18.5 | 1.1 | 9.3 | 0.67 |
| 2 | 16 24.9 | 11 15 48.72 | 6 54 7.2 | 1.0 | 8.8 | 0.63 | 17 | 13 16.1 | 11 7 48.90 | 7 55 10.6 | 1.1 | 9.3 | 0.67 |
| 3 | 16 21.0 | 11 15 46.20 | 6 54 40.4 | 1.0 | 8.8 | 0.63 | 18 | 13 11.9 | 11 7 32.27 | 7 57 3.3 | 1.1 | 9.3 | 0.67 |
| 4 | 16 17.0 | 11 15 43.27 | 6 55 16.2 | 1.0 | 8.9 | 0.63 | 19 | 13 7.7 | 11 7 15.50 | 7 58 56.5 | 1.1 | 9.3 | 0.67 |
| 5 | 16 13.0 | 11 15 39.93 | +6 55 54.4 | 1.0 | 8.9 | 0.64 | 20 | 13 3.5 | 11 6 58.60 | +8 0 50.1 | 1.1 | 9.3 | 0.67 |
| 6 | 16 9.0 | 11 15 36.18 | 6 56 35.2 | 1.0 | 8.9 | 0.64 | 21 | 12 59.3 | 11 6 41.59 | 8 2 44.2 | 1.1 | 9.3 | 0.67 |
| 7 | 16 5.0 | 11 15 32.05 | 6 57 18.4 | 1.0 | 8.9 | 0.64 | 22 | 12 55.0 | 11 6 24.47 | 8 4 38.6 | 1.1 | 9.3 | 0.67 |
| 8 | 16 1.0 | 11 15 27.51 | 6 58 4.0 | 1.0 | 8.9 | 0.64 | 23 | 12 50.8 | 11 6 7.24 | 8 6 33.3 | 1.1 | 9.3 | 0.67 |
| 9 | 15 57.0 | 11 15 22.58 | 6 58 52.0 | 1.0 | 8.9 | 0.64 | 24 | 12 46.6 | 11 5 49.92 | 8 8 28.3 | 1.1 | 9.3 | 0.67 |
| 10 | 15 52.9 | 11 15 17.26 | +6 59 42.4 | 1.0 | 8.9 | 0.64 | 25 | 12 42.4 | 11 5 32.50 | +8 10 23.4 | 1.1 | 9.3 | 0.67 |
| 11 | 15 48.9 | 11 15 11.55 | 7 0 35.1 | 1.0 | 8.9 | 0.64 | 26 | 12 38.2 | 11 5 15.02 | 8 12 18.6 | 1.1 | 9.3 | 0.67 |
| 12 | 15 44.9 | 11 15 5.45 | 7 1 30.2 | 1.0 | 8.9 | 0.64 | 27 | 12 33.9 | 11 4 57.47 | 8 14 13.8 | 1.1 | 9.3 | 0.67 |
| 13 | 15 40.8 | 11 14 58.97 | 7 2 27.6 | 1.0 | 9.0 | 0.65 | 28 | 12 29.7 | 11 4 39.87 | 8 16 9.0 | 1.1 | 9.3 | 0.67 |
| 14 | 15 36.8 | 11 14 52.09 | 7 3 27.3 | 1.0 | 9.0 | 0.65 | Mar. 1 | 12 25.5 | 11 4 22.22 | 8 18 4.2 | 1.1 | 9.3 | 0.67 |
| 15 | 15 32.7 | 11 14 44.85 | +7 4 29.2 | 1.0 | 9.0 | 0.65 | 2 | 12 21.3 | 11 4 4.53 | +8 19 59.2 | 1.1 | 9.3 | 0.67 |
| 16 | 15 28.7 | 11 14 37.24 | 7 5 33.3 | 1.0 | 9.0 | 0.65 | 3 | 12 17.0 | 11 3 46.81 | 8 21 54.0 | 1.1 | 9.3 | 0.67 |
| 17 | 15 24.6 | 11 14 29.26 | 7 6 39.6 | 1.0 | 9.0 | 0.65 | 4 | 12 12.8 | 11 3 29.08 | 8 23 48.6 | 1.1 | 9.3 | 0.67 |
| 18 | 15 20.6 | 11 14 20.92 | 7 7 48.0 | 1.0 | 9.0 | 0.65 | 5 | 12 8.6 | 11 3 11.34 | 8 25 42.8 | 1.1 | 9.3 | 0.67 |
| 19 | 15 16.5 | 11 14 12.22 | 7 8 58.6 | 1.0 | 9.0 | 0.65 | 6 | 12 4.3 | 11 2 53.60 | 8 27 36.6 | 1.1 | 9.3 | 0.67 |
| 20 | 15 12.4 | 11 14 3.16 | +7 10 11.3 | 1.0 | 9.0 | 0.65 | 7 | 12 0.1 | 11 2 35.88 | +8 29 30.0 | 1.1 | 9.3 | 0.67 |
| 21 | 15 8.3 | 11 13 53.76 | 7 11 25.9 | 1.0 | 9.0 | 0.66 | 8 | 11 55.9 | 11 2 18.19 | 8 31 22.9 | 1.1 | 9.3 | 0.67 |
| 22 | 15 4.2 | 11 13 44.01 | 7 12 42.5 | 1.0 | 9.1 | 0.66 | 9 | 11 51.7 | 11 2 0.52 | 8 33 15.2 | 1.1 | 9.3 | 0.67 |
| 23 | 15 0.1 | 11 13 33.92 | 7 14 1.1 | 1.0 | 9.1 | 0.66 | 10 | 11 47.4 | 11 1 42.91 | 8 35 6.8 | 1.1 | 9.3 | 0.67 |
| 24 | 14 56.0 | 11 13 23.50 | 7 15 21.6 | 1.0 | 9.1 | 0.66 | 11 | 11 43.2 | 11 1 25.34 | 8 36 57.7 | 1.1 | 9.3 | 0.67 |
| 25 | 14 51.9 | 11 13 12.75 | +7 16 44.0 | 1.0 | 9.1 | 0.66 | 12 | 11 39.0 | 11 1 7.84 | +8 38 47.9 | 1.1 | 9.3 | 0.67 |
| 26 | 14 47.8 | 11 13 1.67 | 7 18 8.2 | 1.0 | 9.1 | 0.66 | 13 | 11 34.8 | 11 0 50.42 | 8 40 37.2 | 1.1 | 9.3 | 0.67 |
| 27 | 14 43.7 | 11 12 50.27 | 7 19 34.2 | 1.0 | 9.1 | 0.66 | 14 | 11 30.6 | 11 0 33.08 | 8 42 25.6 | 1.1 | 9.3 | 0.67 |
| 28 | 14 39.6 | 11 12 38.56 | 7 21 2.0 | 1.0 | 9.1 | 0.66 | 15 | 11 26.3 | 11 0 15.84 | 8 44 13.1 | 1.1 | 9.3 | 0.67 |
| 29 | 14 35.4 | 11 12 26.54 | 7 22 31.5 | 1.0 | 9.1 | 0.66 | 16 | 11 22.1 | 10 59 58.71 | 8 45 59.6 | 1.1 | 9.3 | 0.67 |
| 30 | 14 31.3 | 11 12 14.22 | +7 24 2.6 | 1.0 | 9.2 | 0.66 | 17 | 11 17.9 | 10 59 41.69 | +8 47 45.0 | 1.1 | 9.3 | 0.67 |
| 31 | 14 27.1 | 11 12 1.60 | 7 25 35.4 | 1.0 | 9.2 | 0.66 | 18 | 11 13.7 | 10 59 24.79 | 8 49 29.3 | 1.1 | 9.3 | 0.67 |
| Feb. 1 | 14 23.0 | 11 11 48.70 | 7 27 9.8 | 1.0 | 9.2 | 0.66 | 19 | 11 9.5 | 10 59 8.03 | 8 51 12.4 | 1.1 | 9.3 | 0.67 |
| 2 | 14 18.8 | 11 11 35.50 | 7 28 45.7 | 1.0 | 9.2 | 0.66 | 20 | 11 5.3 | 10 58 51.41 | 8 52 54.3 | 1.1 | 9.3 | 0.67 |
| 3 | 14 14.7 | 11 11 22.04 | 7 30 23.1 | 1.0 | 9.2 | 0.66 | 21 | 11 1.1 | 10 58 34.93 | 8 54 35.0 | 1.1 | 9.3 | 0.67 |
| 4 | 14 10.5 | 11 11 8.30 | +7 32 1.9 | 1.0 | 9.2 | 0.66 | 22 | 10 56.9 | 10 58 18.62 | +8 56 14.3 | 1.1 | 9.3 | 0.67 |
| 5 | 14 6.4 | 11 10 54.29 | 7 33 42.0 | 1.0 | 9.2 | 0.66 | 23 | 10 52.7 | 10 58 2.47 | 8 57 52.2 | 1.1 | 9.3 | 0.67 |
| 6 | 14 2.2 | 11 10 40.03 | 7 35 23.5 | 1.0 | 9.2 | 0.67 | 24 | 10 48.5 | 10 57 46.49 | 8 59 25.8 | 1.1 | 9.3 | 0.67 |
| 7 | 13 58.0 | 11 10 25.53 | 7 37 6.3 | 1.0 | 9.2 | 0.67 | 25 | 10 44.3 | 10 57 30.70 | 9 1 3.9 | 1.1 | 9.3 | 0.67 |
| 8 | 13 53.9 | 11 10 10.80 | 7 38 50.3 | 1.0 | 9.3 | 0.67 | 26 | 10 40.1 | 10 57 15.10 | 9 2 37.5 | 1.0 | 9.3 | 0.67 |
| 9 | 13 49.7 | 11 9 55.83 | +7 40 35.4 | 1.0 | 9.3 | 0.67 | 27 | 10 35.9 | 10 56 59.69 | +9 4 9.4 | 1.0 | 9.2 | 0.67 |
| 10 | 13 45.5 | 11 9 40.64 | 7 42 21.6 | 1.0 | 9.3 | 0.67 | 28 | 10 31.7 | 10 56 44.48 | 9 5 39.9 | 1.0 | 9.2 | 0.67 |
| 11 | 13 41.3 | 11 9 25.24 | 7 44 8.9 | 1.0 | 9.3 | 0.67 | 29 | 10 27.5 | 10 56 29.49 | 9 7 8.8 | 1.0 | 9.2 | 0.67 |
| 12 | 13 37.1 | 11 9 9.64 | 7 45 57.1 | 1.0 | 9.3 | 0.67 | 30 | 10 23.4 | 10 56 14.72 | 9 8 36.0 | 1.0 | 9.2 | 0.67 |
| 13 | 13 32.9 | 11 8 53.84 | 7 47 46.2 | 1.0 | 9.3 | 0.67 | 31 | 10 19.2 | 10 56 0.18 | 9 10 1.5 | 1.0 | 9.2 | 0.67 |
| 14 | 13 28.7 | 11 8 37.86 | +7 49 36.2 | 1.1 | 9.3 | 0.67 | Apr. 1 | 10 15.0 | 10 55 45.87 | +9 11 25.2 | 1.0 | 9.2 | 0.66 |
| 15 | 13 24.5 | 11 8 21.70 | +7 51 27.0 | 1.1 | 9.3 | 0.67 | 2 | 10 10.8 | 10 55 31.81 | +9 12 47.2 | 1.0 | 9.2 | 0.66 |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Polar Semi-diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Polar Semi-diam. | S.T. of Sem. Pass. Mer. |
|--------|-----------------------|-----------------------------------|----------------------------------|-----------|------------------|-------------------------|--------|-----------------------|-----------------------------------|----------------------------------|-----------|------------------|-------------------------|
| | h m | h m s | ° ' " | " | " | s | | h m | h m s | ° ' " | " | " | s |
| Apr. 1 | 10 15.0 | 10 55 45.87 | +9 11 25.2 | 1.0 | 9.2 | 0.66 | May 17 | 7 9.0 | 10 50 36.58 | +9 36 36.1 | 1.0 | 8.6 | 0.62 |
| 2 | 10 10.8 | 10 55 31.81 | 9 12 47.2 | 1.0 | 9.2 | 0.66 | 18 | 7 5.1 | 10 50 38.60 | 9 36 13.3 | 1.0 | 8.6 | 0.62 |
| 3 | 10 6.7 | 10 55 17.99 | 9 14 7.4 | 1.0 | 9.2 | 0.66 | 19 | 7 1.2 | 10 50 41.00 | 9 35 48.2 | 1.0 | 8.6 | 0.62 |
| 4 | 10 2.5 | 10 55 4.44 | 9 15 25.6 | 1.0 | 9.2 | 0.66 | 20 | 6 57.3 | 10 50 43.78 | 9 35 20.7 | 1.0 | 8.6 | 0.62 |
| 5 | 9 58.4 | 10 54 51.15 | 9 16 42.0 | 1.0 | 9.2 | 0.66 | 21 | 6 53.4 | 10 50 46.94 | 9 34 50.9 | 1.0 | 8.5 | 0.61 |
| 6 | 9 54.2 | 10 54 38.14 | +9 17 56.5 | 1.0 | 9.2 | 0.66 | 22 | 6 49.6 | 10 50 50.49 | +9 34 18.8 | 1.0 | 8.5 | 0.61 |
| 7 | 9 50.1 | 10 54 25.41 | 9 19 8.9 | 1.0 | 9.2 | 0.66 | 23 | 6 45.7 | 10 50 54.42 | 9 33 44.3 | 1.0 | 8.5 | 0.61 |
| 8 | 9 45.9 | 10 54 12.97 | 9 20 19.4 | 1.0 | 9.1 | 0.66 | 24 | 6 41.9 | 10 50 58.73 | 9 33 7.5 | 1.0 | 8.5 | 0.61 |
| 9 | 9 41.8 | 10 54 0.83 | 9 21 27.8 | 1.0 | 9.1 | 0.66 | 25 | 6 38.0 | 10 51 3.42 | 9 32 28.5 | 1.0 | 8.5 | 0.61 |
| 10 | 9 37.7 | 10 53 48.98 | 9 22 34.3 | 1.0 | 9.1 | 0.66 | 26 | 6 34.2 | 10 51 8.49 | 9 31 47.1 | 1.0 | 8.5 | 0.61 |
| 11 | 9 33.5 | 10 53 37.44 | +9 23 38.4 | 1.0 | 9.1 | 0.66 | 27 | 6 30.3 | 10 51 13.93 | +9 31 3.5 | 1.0 | 8.5 | 0.61 |
| 12 | 9 29.4 | 10 53 26.20 | 9 24 40.5 | 1.0 | 9.1 | 0.66 | 28 | 6 26.5 | 10 51 19.75 | 9 30 17.6 | 1.0 | 8.5 | 0.61 |
| 13 | 9 25.3 | 10 53 15.28 | 9 25 40.5 | 1.0 | 9.1 | 0.66 | 29 | 6 22.6 | 10 51 25.95 | 9 29 29.4 | 1.0 | 8.4 | 0.61 |
| 14 | 9 21.2 | 10 53 4.68 | 9 26 38.3 | 1.0 | 9.1 | 0.66 | 30 | 6 18.8 | 10 51 32.52 | 9 28 39.0 | 1.0 | 8.4 | 0.61 |
| 15 | 9 17.1 | 10 52 54.41 | 9 27 33.9 | 1.0 | 9.1 | 0.66 | 31 | 6 15.0 | 10 51 39.46 | 9 27 46.4 | 1.0 | 8.4 | 0.61 |
| 16 | 9 13.0 | 10 52 44.47 | +9 28 27.2 | 1.0 | 9.1 | 0.66 | Dec. 1 | 19 15.0 | 11 59 11.42 | +2 23 5.6 | 0.9 | 8.1 | 0.58 |
| 17 | 9 8.9 | 10 52 34.86 | 9 29 18.3 | 1.0 | 9.0 | 0.66 | 2 | 19 11.3 | 11 59 26.01 | 2 21 47.1 | 0.9 | 8.1 | 0.58 |
| 18 | 9 4.8 | 10 52 25.59 | 9 30 7.2 | 1.0 | 9.0 | 0.65 | 3 | 19 7.6 | 11 59 40.26 | 2 20 30.9 | 0.9 | 8.1 | 0.58 |
| 19 | 9 0.8 | 10 52 16.66 | 9 30 53.9 | 1.0 | 9.0 | 0.65 | 4 | 19 3.9 | 11 59 54.18 | 2 19 17.0 | 0.9 | 8.1 | 0.58 |
| 20 | 8 56.7 | 10 52 8.08 | 9 31 38.1 | 1.0 | 9.0 | 0.65 | 5 | 19 0.2 | 12 0 7.77 | 2 18 5.4 | 0.9 | 8.1 | 0.58 |
| 21 | 8 52.6 | 10 51 59.85 | +9 32 20.0 | 1.0 | 9.0 | 0.65 | 6 | 18 56.5 | 12 0 21.02 | +2 16 56.1 | 0.9 | 8.1 | 0.58 |
| 22 | 8 48.5 | 10 51 51.98 | 9 32 59.7 | 1.0 | 9.0 | 0.65 | 7 | 18 52.7 | 12 0 33.92 | 2 15 49.2 | 0.9 | 8.2 | 0.58 |
| 23 | 8 44.5 | 10 51 44.46 | 9 33 37.1 | 1.0 | 9.0 | 0.65 | 8 | 18 49.0 | 12 0 46.47 | 2 14 44.6 | 0.9 | 8.2 | 0.58 |
| 24 | 8 40.5 | 10 51 37.29 | 9 34 12.1 | 1.0 | 9.0 | 0.65 | 9 | 18 45.3 | 12 0 58.68 | 2 13 42.4 | 0.9 | 8.2 | 0.58 |
| 25 | 8 36.4 | 10 51 30.48 | 9 34 44.8 | 1.0 | 8.9 | 0.65 | 10 | 18 41.5 | 12 1 10.55 | 2 12 42.5 | 0.9 | 8.2 | 0.58 |
| 26 | 8 32.4 | 10 51 24.04 | +9 35 15.0 | 1.0 | 8.9 | 0.65 | 11 | 18 37.8 | 12 1 22.06 | +2 11 45.0 | 0.9 | 8.2 | 0.58 |
| 27 | 8 28.3 | 10 51 17.97 | 9 35 43.0 | 1.0 | 8.9 | 0.64 | 12 | 18 34.1 | 12 1 33.21 | 2 10 50.0 | 0.9 | 8.2 | 0.58 |
| 28 | 8 24.3 | 10 51 12.26 | 9 36 8.6 | 1.0 | 8.9 | 0.64 | 13 | 18 30.3 | 12 1 44.01 | 2 9 57.4 | 0.9 | 8.2 | 0.59 |
| 29 | 8 20.3 | 10 51 6.93 | 9 36 31.8 | 1.0 | 8.9 | 0.64 | 14 | 18 26.5 | 12 1 54.44 | 2 9 7.2 | 0.9 | 8.2 | 0.59 |
| 30 | 8 16.3 | 10 51 1.97 | 9 36 52.6 | 1.0 | 8.9 | 0.64 | 15 | 18 22.8 | 12 2 4.52 | 2 8 19.4 | 0.9 | 8.3 | 0.59 |
| May 1 | 8 12.3 | 10 50 57.39 | +9 37 11.0 | 1.0 | 8.9 | 0.64 | 16 | 18 19.0 | 12 2 14.23 | +2 7 34.2 | 0.9 | 8.3 | 0.59 |
| 2 | 8 8.3 | 10 50 53.18 | 9 37 27.0 | 1.0 | 8.8 | 0.64 | 17 | 18 15.2 | 12 2 23.57 | 2 6 51.4 | 0.9 | 8.3 | 0.59 |
| 3 | 8 4.3 | 10 50 49.35 | 9 37 40.6 | 1.0 | 8.8 | 0.64 | 18 | 18 11.5 | 12 2 32.53 | 2 6 11.0 | 0.9 | 8.3 | 0.59 |
| 4 | 8 0.3 | 10 50 45.91 | 9 37 51.8 | 1.0 | 8.8 | 0.64 | 19 | 18 7.7 | 12 2 41.13 | 2 5 33.2 | 0.9 | 8.3 | 0.59 |
| 5 | 7 56.3 | 10 50 42.87 | 9 38 0.6 | 1.0 | 8.8 | 0.63 | 20 | 18 3.9 | 12 2 49.35 | 2 4 57.9 | 0.9 | 8.3 | 0.59 |
| 6 | 7 52.3 | 10 50 40.20 | +9 38 6.9 | 1.0 | 8.8 | 0.63 | 21 | 18 0.1 | 12 2 57.19 | +2 4 25.1 | 0.9 | 8.3 | 0.59 |
| 7 | 7 48.4 | 10 50 37.92 | 9 38 10.8 | 1.0 | 8.8 | 0.63 | 22 | 17 56.3 | 12 3 4.65 | 2 3 55.0 | 0.9 | 8.3 | 0.59 |
| 8 | 7 44.4 | 10 50 36.02 | 9 38 12.3 | 1.0 | 8.7 | 0.63 | 23 | 17 52.4 | 12 3 11.73 | 2 3 27.3 | 0.9 | 8.4 | 0.60 |
| 9 | 7 40.4 | 10 50 34.52 | 9 38 11.3 | 1.0 | 8.7 | 0.63 | 24 | 17 48.6 | 12 3 18.41 | 2 3 2.2 | 0.9 | 8.4 | 0.60 |
| 10 | 7 36.5 | 10 50 33.44 | 9 38 7.9 | 1.0 | 8.7 | 0.63 | 25 | 17 44.8 | 12 3 24.71 | 2 2 39.7 | 1.0 | 8.4 | 0.60 |
| 11 | 7 32.6 | 10 50 32.69 | +9 38 2.0 | 1.0 | 8.7 | 0.63 | 26 | 17 41.0 | 12 3 30.62 | +2 2 19.7 | 1.0 | 8.4 | 0.60 |
| 12 | 7 28.6 | 10 50 32.36 | 9 37 53.8 | 1.0 | 8.7 | 0.63 | 27 | 17 37.1 | 12 3 36.14 | 2 2 2.3 | 1.0 | 8.4 | 0.60 |
| 13 | 7 24.7 | 10 50 32.42 | 9 37 43.1 | 1.0 | 8.7 | 0.63 | 28 | 17 33.3 | 12 3 41.27 | 2 1 47.6 | 1.0 | 8.4 | 0.60 |
| 14 | 7 20.8 | 10 50 32.87 | 9 37 29.9 | 1.0 | 8.6 | 0.62 | 29 | 17 29.4 | 12 3 46.00 | 2 1 35.5 | 1.0 | 8.4 | 0.60 |
| 15 | 7 16.8 | 10 50 33.72 | 9 37 14.4 | 1.0 | 8.6 | 0.62 | 30 | 17 25.6 | 12 3 50.33 | 2 1 25.9 | 1.0 | 8.4 | 0.60 |
| 16 | 7 12.9 | 10 50 34.96 | +9 36 56.4 | 1.0 | 8.6 | 0.62 | 31 | 17 21.7 | 12 3 54.26 | +2 1 19.0 | 1.0 | 8.5 | 0.60 |
| 17 | 7 9.0 | 10 50 36.58 | +9 36 36.1 | 1.0 | 8.6 | 0.62 | 32 | 17 17.8 | 12 3 57.78 | +2 1 14.7 | 1.0 | 8.5 | 0.60 |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. |
|---------|--------------------------------|--|---|--------------|----------------|----------------------------------|--------|--------------------------------|--|---|--------------|----------------|----------------------------------|
| | h m | h m s | ° ' " | " | " | " | | h m | h m s | ° ' " | " | " | " |
| Jan. 15 | 18 14.7 | 13 57 8.65 | -11 23 54.0 | 0.5 | 1.8 | 0.12 | Mar. 1 | 15 17.3 | 13 56 41.24 | -11 20 21.8 | 0.5 | 1.9 | 0.13 |
| 16 | 18 10.8 | 13 57 12.65 | -11 24 14.3 | 0.5 | 1.8 | 0.12 | 2 | 15 13.3 | 13 56 36.06 | -11 19 52.5 | 0.5 | 1.9 | 0.13 |
| 17 | 18 7.0 | 13 57 16.43 | -11 24 33.4 | 0.5 | 1.8 | 0.12 | 3 | 15 9.3 | 13 56 30.71 | -11 19 22.3 | 0.5 | 1.9 | 0.13 |
| 18 | 18 3.1 | 13 57 20.01 | -11 24 51.3 | 0.5 | 1.8 | 0.12 | 4 | 15 5.3 | 13 56 25.19 | -11 18 51.1 | 0.5 | 1.9 | 0.13 |
| 19 | 17 59.2 | 13 57 23.38 | -11 25 8.1 | 0.5 | 1.6 | 0.12 | 5 | 15 1.2 | 13 56 19.50 | -11 18 19.0 | 0.5 | 1.9 | 0.13 |
| 20 | 17 55.3 | 13 57 26.54 | -11 25 23.8 | 0.5 | 1.8 | 0.12 | 6 | 14 57.2 | 13 56 13.64 | -11 17 46.0 | 0.5 | 1.9 | 0.13 |
| 21 | 17 51.5 | 13 57 29.48 | -11 25 38.4 | 0.5 | 1.8 | 0.12 | 7 | 14 53.2 | 13 56 7.61 | -11 17 12.1 | 0.5 | 1.9 | 0.13 |
| 22 | 17 47.6 | 13 57 32.22 | -11 25 51.8 | 0.5 | 1.8 | 0.12 | 8 | 14 49.1 | 13 56 1.43 | -11 16 37.4 | 0.5 | 1.9 | 0.13 |
| 23 | 17 43.7 | 13 57 34.75 | -11 26 4.0 | 0.5 | 1.8 | 0.12 | 9 | 14 45.1 | 13 55 55.08 | -11 16 1.8 | 0.5 | 1.9 | 0.13 |
| 24 | 17 39.8 | 13 57 37.06 | -11 26 15.1 | 0.5 | 1.8 | 0.12 | 10 | 14 41.0 | 13 55 48.58 | -11 15 25.3 | 0.5 | 1.9 | 0.13 |
| 25 | 17 35.9 | 13 57 39.17 | -11 26 25.0 | 0.5 | 1.8 | 0.12 | 11 | 14 37.0 | 13 55 41.93 | -11 14 48.1 | 0.5 | 1.9 | 0.13 |
| 26 | 17 32.0 | 13 57 41.06 | -11 26 33.8 | 0.5 | 1.8 | 0.12 | 12 | 14 33.0 | 13 55 35.13 | -11 14 10.1 | 0.5 | 1.9 | 0.13 |
| 27 | 17 28.1 | 13 57 42.74 | -11 26 41.4 | 0.5 | 1.8 | 0.12 | 13 | 14 28.9 | 13 55 28.18 | -11 13 31.2 | 0.5 | 1.9 | 0.13 |
| 28 | 17 24.2 | 13 57 44.20 | -11 26 47.9 | 0.5 | 1.8 | 0.12 | 14 | 14 24.9 | 13 55 21.08 | -11 12 51.6 | 0.5 | 1.9 | 0.13 |
| 29 | 17 20.3 | 13 57 45.45 | -11 26 53.2 | 0.5 | 1.8 | 0.12 | 15 | 14 20.8 | 13 55 13.85 | -11 12 11.3 | 0.5 | 1.9 | 0.13 |
| 30 | 17 16.3 | 13 57 46.49 | -11 26 57.3 | 0.5 | 1.8 | 0.12 | 16 | 14 16.8 | 13 55 6.49 | -11 11 30.2 | 0.5 | 1.9 | 0.13 |
| 31 | 17 12.4 | 13 57 47.32 | -11 27 0.3 | 0.5 | 1.8 | 0.12 | 17 | 14 12.7 | 13 54 58.99 | -11 10 48.4 | 0.5 | 1.9 | 0.13 |
| Feb. 1 | 17 8.5 | 13 57 47.93 | -11 27 2.2 | 0.5 | 1.8 | 0.12 | 18 | 14 8.6 | 13 54 51.36 | -11 10 5.9 | 0.5 | 1.9 | 0.13 |
| 2 | 17 4.6 | 13 57 48.33 | -11 27 2.9 | 0.5 | 1.8 | 0.12 | 19 | 14 4.6 | 13 54 43.61 | -11 9 22.7 | 0.5 | 1.9 | 0.13 |
| 3 | 17 0.7 | 13 57 48.51 | -11 27 2.4 | 0.5 | 1.8 | 0.13 | 20 | 14 0.5 | 13 54 35.74 | -11 8 38.9 | 0.5 | 1.9 | 0.13 |
| 4 | 16 56.7 | 13 57 48.49 | -11 27 0.8 | 0.5 | 1.8 | 0.13 | 21 | 13 56.5 | 13 54 27.74 | -11 7 54.5 | 0.5 | 1.9 | 0.13 |
| 5 | 16 52.8 | 13 57 48.25 | -11 26 58.0 | 0.5 | 1.8 | 0.13 | 22 | 13 52.4 | 13 54 19.63 | -11 7 9.4 | 0.5 | 1.9 | 0.13 |
| 6 | 16 48.9 | 13 57 47.79 | -11 26 54.1 | 0.5 | 1.8 | 0.13 | 23 | 13 48.3 | 13 54 11.42 | -11 6 23.8 | 0.5 | 1.9 | 0.13 |
| 7 | 16 44.9 | 13 57 47.12 | -11 26 49.0 | 0.5 | 1.8 | 0.13 | 24 | 13 44.2 | 13 54 3.09 | -11 5 37.6 | 0.5 | 1.9 | 0.13 |
| 8 | 16 41.0 | 13 57 46.25 | -11 26 42.8 | 0.5 | 1.8 | 0.13 | 25 | 13 40.2 | 13 53 54.66 | -11 4 50.8 | 0.5 | 1.9 | 0.13 |
| 9 | 16 37.0 | 13 57 45.16 | -11 26 35.5 | 0.5 | 1.8 | 0.13 | 26 | 13 36.1 | 13 53 46.13 | -11 4 3.4 | 0.5 | 1.9 | 0.13 |
| 10 | 16 33.1 | 13 57 43.86 | -11 26 27.0 | 0.5 | 1.9 | 0.13 | 27 | 13 32.0 | 13 53 37.51 | -11 3 15.6 | 0.5 | 1.9 | 0.13 |
| 11 | 16 29.1 | 13 57 42.35 | -11 26 17.4 | 0.5 | 1.9 | 0.13 | 28 | 13 28.0 | 13 53 28.79 | -11 2 27.3 | 0.5 | 1.9 | 0.13 |
| 12 | 16 25.1 | 13 57 40.64 | -11 26 6.7 | 0.5 | 1.9 | 0.13 | 29 | 13 23.9 | 13 53 19.98 | -11 1 38.5 | 0.5 | 1.9 | 0.13 |
| 13 | 16 21.2 | 13 57 38.72 | -11 25 54.9 | 0.5 | 1.9 | 0.13 | 30 | 13 19.8 | 13 53 11.08 | -11 0 49.2 | 0.5 | 1.9 | 0.13 |
| 14 | 16 17.2 | 13 57 36.60 | -11 25 42.0 | 0.5 | 1.9 | 0.13 | 31 | 13 15.7 | 13 53 2.10 | -10 59 59.5 | 0.5 | 1.9 | 0.13 |
| 15 | 16 13.2 | 13 57 34.27 | -11 25 27.9 | 0.5 | 1.9 | 0.13 | Apr. 1 | 13 11.6 | 13 52 53.05 | -10 59 9.3 | 0.5 | 1.9 | 0.13 |
| 16 | 16 9.3 | 13 57 31.74 | -11 25 12.8 | 0.5 | 1.9 | 0.13 | 2 | 13 7.6 | 13 52 43.92 | -10 58 18.8 | 0.5 | 1.9 | 0.13 |
| 17 | 16 5.3 | 13 57 29.01 | -11 24 56.6 | 0.5 | 1.9 | 0.13 | 3 | 13 3.5 | 13 52 34.71 | -10 57 27.9 | 0.5 | 1.9 | 0.13 |
| 18 | 16 1.3 | 13 57 26.08 | -11 24 39.4 | 0.5 | 1.9 | 0.13 | 4 | 12 59.4 | 13 52 25.44 | -10 56 36.6 | 0.5 | 1.9 | 0.13 |
| 19 | 15 57.3 | 13 57 22.95 | -11 24 21.1 | 0.5 | 1.9 | 0.13 | 5 | 12 55.3 | 13 52 16.12 | -10 55 45.0 | 0.5 | 1.9 | 0.13 |
| 20 | 15 53.3 | 13 57 19.63 | -11 24 1.7 | 0.5 | 1.9 | 0.13 | 6 | 12 51.2 | 13 52 6.73 | -10 54 53.1 | 0.5 | 1.9 | 0.13 |
| 21 | 15 49.3 | 13 57 16.11 | -11 23 41.3 | 0.5 | 1.9 | 0.13 | 7 | 12 47.1 | 13 51 57.28 | -10 54 0.9 | 0.5 | 1.9 | 0.13 |
| 22 | 15 45.3 | 13 57 12.41 | -11 23 19.8 | 0.5 | 1.9 | 0.13 | 8 | 12 43.0 | 13 51 47.79 | -10 53 8.4 | 0.5 | 1.9 | 0.13 |
| 23 | 15 41.3 | 13 57 8.51 | -11 22 57.4 | 0.5 | 1.9 | 0.13 | 9 | 12 38.9 | 13 51 38.26 | -10 52 15.7 | 0.5 | 1.9 | 0.13 |
| 24 | 15 37.3 | 13 57 4.43 | -11 22 34.0 | 0.5 | 1.9 | 0.13 | 10 | 12 34.8 | 13 51 28.68 | -10 51 22.8 | 0.5 | 1.9 | 0.13 |
| 25 | 15 33.3 | 13 57 0.16 | -11 22 9.5 | 0.5 | 1.9 | 0.13 | 11 | 12 30.8 | 13 51 19.07 | -10 50 29.7 | 0.5 | 1.9 | 0.13 |
| 26 | 15 29.3 | 13 56 55.70 | -11 21 44.0 | 0.5 | 1.9 | 0.13 | 12 | 12 26.7 | 13 51 9.43 | -10 49 36.5 | 0.5 | 1.9 | 0.13 |
| 27 | 15 25.3 | 13 56 51.06 | -11 21 17.6 | 0.5 | 1.9 | 0.13 | 13 | 12 22.6 | 13 50 59.76 | -10 48 43.1 | 0.5 | 1.9 | 0.13 |
| 28 | 15 21.3 | 13 56 46.24 | -11 20 50.2 | 0.5 | 1.9 | 0.13 | 14 | 12 18.5 | 13 50 50.06 | -10 47 49.6 | 0.5 | 1.9 | 0.13 |
| Mar. 1 | 15 17.3 | 13 56 41.24 | -11 20 21.8 | 0.5 | 1.9 | 0.13 | 15 | 12 14.4 | 13 50 40.35 | -10 46 56.0 | 0.5 | 1.9 | 0.13 |
| 2 | 15 13.3 | 13 56 36.06 | -11 19 52.5 | 0.5 | 1.9 | 0.13 | 16 | 12 10.3 | 13 50 30.62 | -10 46 2.3 | 0.5 | 1.9 | 0.13 |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. |
|---------|--------------------------------|--|---|--------------|----------------|----------------------------------|--------|--------------------------------|--|---|--------------|----------------|----------------------------------|
| | h m | h m s | ° ' " | " | " | s | | h m | h m s | ° ' " | " | " | s |
| Apr. 16 | 12 10.3 | 13 50 30.62 | -10 46 2.3 | 0.5 | 1.9 | 0.13 | June 1 | 9 2.9 | 13 43 56.07 | -10 10 4.3 | 0.5 | 1.9 | 0.13 |
| 17 | 12 6.2 | 13 50 20.89 | 10 45 8.6 | 0.5 | 1.9 | 0.13 | 2 | 8 58.8 | 13 43 49.99 | 10 9 31.7 | 0.5 | 1.9 | 0.13 |
| 18 | 12 2.1 | 13 50 11.15 | 10 44 14.9 | 0.5 | 1.9 | 0.13 | 3 | 8 54.8 | 13 43 44.06 | 10 9 0.0 | 0.5 | 1.9 | 0.13 |
| 19 | 11 58.0 | 13 50 1.40 | 10 43 21.2 | 0.5 | 1.9 | 0.13 | 4 | 8 50.8 | 13 43 38.29 | 10 8 29.3 | 0.5 | 1.9 | 0.13 |
| 20 | 11 53.9 | 13 49 51.66 | 10 42 27.5 | 0.5 | 1.9 | 0.13 | 5 | 8 46.8 | 13 43 32.67 | 10 7 59.5 | 0.5 | 1.9 | 0.13 |
| 21 | 11 49.8 | 13 49 41.93 | -10 41 33.9 | 0.5 | 1.9 | 0.13 | 6 | 8 42.7 | 13 43 27.22 | -10 7 30.6 | 0.5 | 1.9 | 0.13 |
| 22 | 11 45.7 | 13 49 32.21 | 10 40 40.3 | 0.5 | 1.9 | 0.13 | 7 | 8 38.7 | 13 43 21.94 | 10 7 2.6 | 0.5 | 1.9 | 0.13 |
| 23 | 11 41.6 | 13 49 22.50 | 10 39 46.8 | 0.5 | 1.9 | 0.13 | 8 | 8 34.7 | 13 43 16.82 | 10 6 35.6 | 0.5 | 1.9 | 0.13 |
| 24 | 11 37.5 | 13 49 12.80 | 10 38 53.4 | 0.5 | 1.9 | 0.13 | 9 | 8 30.7 | 13 43 11.88 | 10 6 9.5 | 0.5 | 1.9 | 0.13 |
| 25 | 11 33.4 | 13 49 3.13 | 10 38 0.2 | 0.5 | 1.9 | 0.13 | 10 | 8 26.7 | 13 43 7.09 | 10 5 44.4 | 0.5 | 1.9 | 0.13 |
| 26 | 11 29.4 | 13 48 53.49 | -10 37 7.1 | 0.5 | 1.9 | 0.13 | 11 | 8 22.7 | 13 43 2.48 | -10 5 20.4 | 0.5 | 1.9 | 0.13 |
| 27 | 11 25.3 | 13 48 43.87 | 10 36 14.2 | 0.5 | 1.9 | 0.13 | 12 | 8 18.7 | 13 42 58.05 | 10 4 57.3 | 0.5 | 1.9 | 0.13 |
| 28 | 11 21.2 | 13 48 34.29 | 10 35 21.5 | 0.5 | 1.9 | 0.13 | 13 | 8 14.7 | 13 42 53.79 | 10 4 35.2 | 0.5 | 1.9 | 0.13 |
| 29 | 11 17.1 | 13 48 24.75 | 10 34 29.0 | 0.5 | 1.9 | 0.13 | 14 | 8 10.7 | 13 42 49.71 | 10 4 14.2 | 0.5 | 1.9 | 0.13 |
| 30 | 11 13.0 | 13 48 15.25 | 10 33 36.8 | 0.5 | 1.9 | 0.13 | 15 | 8 6.7 | 13 42 45.80 | 10 3 54.2 | 0.5 | 1.9 | 0.13 |
| May 1 | 11 8.9 | 13 48 5.79 | -10 32 44.9 | 0.5 | 1.9 | 0.13 | 16 | 8 2.7 | 13 42 42.08 | -10 3 35.2 | 0.5 | 1.9 | 0.13 |
| 2 | 11 4.8 | 13 47 56.39 | 10 31 53.2 | 0.5 | 1.9 | 0.13 | 17 | 7 58.7 | 13 42 38.54 | 10 3 17.3 | 0.5 | 1.9 | 0.13 |
| 3 | 11 0.7 | 13 47 47.04 | 10 31 1.8 | 0.5 | 1.9 | 0.13 | 18 | 7 54.7 | 13 42 35.18 | 10 3 0.4 | 0.5 | 1.9 | 0.13 |
| 4 | 10 56.6 | 13 47 37.75 | 10 30 10.8 | 0.5 | 1.9 | 0.13 | 19 | 7 50.7 | 13 42 32.00 | 10 2 44.6 | 0.5 | 1.9 | 0.13 |
| 5 | 10 52.6 | 13 47 28.52 | 10 29 20.1 | 0.5 | 1.9 | 0.13 | 20 | 7 46.7 | 13 42 29.01 | 10 2 29.8 | 0.5 | 1.9 | 0.13 |
| 6 | 10 48.5 | 13 47 19.35 | -10 28 29.8 | 0.5 | 1.9 | 0.13 | 21 | 7 42.7 | 13 42 26.21 | -10 2 16.1 | 0.5 | 1.9 | 0.13 |
| 7 | 10 44.4 | 13 47 10.26 | 10 27 40.0 | 0.5 | 1.9 | 0.13 | 22 | 7 38.8 | 13 42 23.59 | 10 2 3.5 | 0.5 | 1.9 | 0.13 |
| 8 | 10 40.3 | 13 47 1.23 | 10 26 50.5 | 0.5 | 1.9 | 0.13 | 23 | 7 34.8 | 13 42 21.16 | 10 1 51.9 | 0.5 | 1.9 | 0.13 |
| 9 | 10 36.2 | 13 46 52.29 | 10 26 1.5 | 0.5 | 1.9 | 0.13 | 24 | 7 30.8 | 13 42 18.92 | 10 1 41.4 | 0.5 | 1.9 | 0.13 |
| 10 | 10 32.2 | 13 46 43.43 | 10 25 13.0 | 0.5 | 1.9 | 0.13 | 25 | 7 26.8 | 13 42 16.86 | 10 1 31.9 | 0.5 | 1.9 | 0.13 |
| 11 | 10 28.1 | 13 46 34.66 | -10 24 25.0 | 0.5 | 1.9 | 0.13 | 26 | 7 22.9 | 13 42 15.00 | -10 1 23.6 | 0.5 | 1.9 | 0.13 |
| 12 | 10 24.0 | 13 46 25.97 | 10 23 37.5 | 0.5 | 1.9 | 0.13 | 27 | 7 18.9 | 13 42 13.33 | 10 1 16.4 | 0.5 | 1.9 | 0.13 |
| 13 | 10 19.9 | 13 46 17.38 | 10 22 50.5 | 0.5 | 1.9 | 0.13 | 28 | 7 15.0 | 13 42 11.85 | 10 1 10.3 | 0.5 | 1.9 | 0.13 |
| 14 | 10 15.9 | 13 46 8.89 | 10 22 4.1 | 0.5 | 1.9 | 0.13 | 29 | 7 11.0 | 13 42 10.56 | 10 1 5.3 | 0.5 | 1.9 | 0.13 |
| 15 | 10 11.8 | 13 46 0.50 | 10 21 18.3 | 0.5 | 1.9 | 0.13 | 30 | 7 7.1 | 13 42 9.47 | 10 1 1.4 | 0.5 | 1.8 | 0.13 |
| 16 | 10 7.7 | 13 45 52.21 | -10 20 33.0 | 0.5 | 1.9 | 0.13 | July 1 | 7 3.1 | 13 42 8.57 | -10 0 58.6 | 0.5 | 1.8 | 0.13 |
| 17 | 10 3.6 | 13 45 44.02 | 10 19 48.4 | 0.5 | 1.9 | 0.13 | 2 | 6 59.2 | 13 42 7.87 | 10 0 56.9 | 0.5 | 1.8 | 0.12 |
| 18 | 9 59.6 | 13 45 35.95 | 10 19 4.4 | 0.5 | 1.9 | 0.13 | 3 | 6 55.2 | 13 42 7.37 | 10 0 56.3 | 0.5 | 1.8 | 0.12 |
| 19 | 9 55.5 | 13 45 27.99 | 10 18 21.1 | 0.5 | 1.9 | 0.13 | 4 | 6 51.3 | 13 42 7.07 | 10 0 56.9 | 0.5 | 1.8 | 0.12 |
| 20 | 9 51.5 | 13 45 20.14 | 10 17 38.4 | 0.5 | 1.9 | 0.13 | 5 | 6 47.4 | 13 42 6.97 | 10 0 58.6 | 0.5 | 1.8 | 0.12 |
| 21 | 9 47.4 | 13 45 12.42 | -10 16 56.4 | 0.5 | 1.9 | 0.13 | 6 | 6 43.4 | 13 42 7.06 | -10 1 1.5 | 0.5 | 1.8 | 0.12 |
| 22 | 9 43.3 | 13 45 4.82 | 10 16 15.2 | 0.5 | 1.9 | 0.13 | 7 | 6 39.5 | 13 42 7.35 | 10 1 5.5 | 0.5 | 1.8 | 0.12 |
| 23 | 9 39.3 | 13 44 57.34 | 10 15 34.6 | 0.5 | 1.9 | 0.13 | 8 | 6 35.6 | 13 42 7.84 | 10 1 10.6 | 0.5 | 1.8 | 0.12 |
| 24 | 9 35.2 | 13 44 49.98 | 10 14 54.8 | 0.5 | 1.9 | 0.13 | 9 | 6 31.7 | 13 42 8.53 | 10 1 16.9 | 0.5 | 1.8 | 0.12 |
| 25 | 9 31.2 | 13 44 42.76 | 10 14 15.7 | 0.5 | 1.9 | 0.13 | 10 | 6 27.7 | 13 42 9.42 | 10 1 24.3 | 0.5 | 1.8 | 0.12 |
| 26 | 9 27.1 | 13 44 35.67 | -10 13 37.4 | 0.5 | 1.9 | 0.13 | 11 | 6 23.8 | 13 42 10.50 | -10 1 32.8 | 0.5 | 1.8 | 0.12 |
| 27 | 9 23.1 | 13 44 28.72 | 10 12 59.8 | 0.5 | 1.9 | 0.13 | 12 | 6 19.9 | 13 42 11.79 | 10 1 42.5 | 0.5 | 1.8 | 0.12 |
| 28 | 9 19.0 | 13 44 21.90 | 10 12 23.0 | 0.5 | 1.9 | 0.13 | 13 | 6 16.0 | 13 42 13.27 | 10 1 53.3 | 0.5 | 1.8 | 0.12 |
| 29 | 9 15.0 | 13 44 15.22 | 10 11 47.1 | 0.5 | 1.9 | 0.13 | 14 | 6 12.1 | 13 42 14.96 | 10 2 5.2 | 0.5 | 1.8 | 0.12 |
| 30 | 9 11.0 | 13 44 8.69 | 10 11 12.0 | 0.5 | 1.9 | 0.13 | 15 | 6 8.2 | 13 42 16.84 | 10 2 18.2 | 0.5 | 1.8 | 0.12 |
| 31 | 9 6.9 | 13 44 2.31 | -10 10 37.7 | 0.5 | 1.9 | 0.13 | 16 | 6 4.3 | 13 42 18.91 | -10 2 32.4 | 0.5 | 1.8 | 0.12 |
| June 1 | 9 2.9 | 13 43 56.07 | -10 10 4.3 | 0.5 | 1.9 | 0.13 | 17 | 6 0.4 | 13 42 21.18 | -10 2 47.6 | 0.5 | 1.8 | 0.12 |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi- diam. | S.T. of Sem. Pass. Mer. |
|--------|--------------------------------|--|---|--------------|----------------|----------------------------------|---------|--------------------------------|--|---|--------------|----------------|----------------------------------|
| | h m | h m s | ° ' " | " | " | s | | h m | h m s | ° ' " | " | " | s |
| Jan. 1 | 9 25.5 | 4 11 19.24 | +19 25 15.0 | 0.3 | 1.3 | 0.09 | Feb. 15 | 6 26.6 | 4 9 17.94 | +19 22 22.8 | 0.3 | 1.3 | 0.09 |
| 2 | 9 21.5 | 4 11 13.93 | 19 25 3.6 | 0.3 | 1.3 | 0.09 | 16 | 6 22.7 | 4 9 18.36 | 19 22 27.6 | 0.3 | 1.3 | 0.09 |
| 3 | 9 17.5 | 4 11 8.72 | 19 24 52.5 | 0.3 | 1.3 | 0.09 | 17 | 6 18.7 | 4 9 18.92 | 19 22 32.8 | 0.3 | 1.3 | 0.09 |
| 4 | 9 13.5 | 4 11 3.60 | 19 24 41.7 | 0.3 | 1.3 | 0.09 | 18 | 6 14.8 | 4 9 19.63 | 19 22 38.4 | 0.3 | 1.3 | 0.09 |
| 5 | 9 9.5 | 4 10 58.59 | 19 24 31.2 | 0.3 | 1.3 | 0.09 | 19 | 6 10.9 | 4 9 20.48 | 19 22 44.4 | 0.3 | 1.3 | 0.09 |
| 6 | 9 5.4 | 4 10 53.67 | +19 24 21.0 | 0.3 | 1.3 | 0.09 | 20 | 6 7.0 | 4 9 21.48 | +19 22 50.8 | 0.3 | 1.3 | 0.09 |
| 7 | 9 1.4 | 4 10 48.86 | 19 24 11.1 | 0.3 | 1.3 | 0.09 | 21 | 6 3.1 | 4 9 22.61 | 19 22 57.6 | 0.3 | 1.3 | 0.09 |
| 8 | 8 57.4 | 4 10 44.14 | 19 24 1.4 | 0.3 | 1.3 | 0.09 | 22 | 5 59.2 | 4 9 23.89 | 19 23 4.7 | 0.3 | 1.3 | 0.09 |
| 9 | 8 53.4 | 4 10 39.53 | 19 23 52.1 | 0.3 | 1.3 | 0.09 | 23 | 5 55.3 | 4 9 25.31 | 19 23 12.2 | 0.3 | 1.3 | 0.09 |
| 10 | 8 49.4 | 4 10 35.04 | 19 23 43.2 | 0.3 | 1.3 | 0.09 | 24 | 5 51.4 | 4 9 26.87 | 19 23 20.1 | 0.3 | 1.3 | 0.09 |
| 11 | 8 45.4 | 4 10 30.66 | +19 23 34.5 | 0.3 | 1.3 | 0.09 | 25 | 5 47.5 | 4 9 28.57 | +19 23 28.3 | 0.3 | 1.3 | 0.09 |
| 12 | 8 41.4 | 4 10 26.40 | 19 23 26.2 | 0.3 | 1.3 | 0.09 | 26 | 5 43.5 | 4 9 30.42 | 19 23 36.9 | 0.3 | 1.3 | 0.09 |
| 13 | 8 37.4 | 4 10 22.26 | 19 23 18.3 | 0.3 | 1.3 | 0.09 | 27 | 5 39.6 | 4 9 32.41 | 19 23 45.9 | 0.3 | 1.3 | 0.09 |
| 14 | 8 33.4 | 4 10 18.23 | 19 23 10.7 | 0.3 | 1.3 | 0.09 | 28 | 5 35.7 | 4 9 34.53 | 19 23 55.2 | 0.3 | 1.3 | 0.09 |
| 15 | 8 29.4 | 4 10 14.31 | 19 23 3.4 | 0.3 | 1.3 | 0.09 | 29 | 5 31.9 | 4 9 36.80 | 19 24 4.9 | 0.3 | 1.3 | 0.09 |
| 16 | 8 25.4 | 4 10 10.51 | +19 22 56.5 | 0.3 | 1.3 | 0.09 | Sept. 1 | 17 45.1 | 4 30 22.91 | +20 14 38.4 | 0.3 | 1.3 | 0.09 |
| 17 | 8 21.4 | 4 10 6.83 | 19 22 49.9 | 0.3 | 1.3 | 0.09 | 2 | 17 41.2 | 4 30 24.23 | 20 14 38.2 | 0.3 | 1.3 | 0.09 |
| 18 | 8 17.4 | 4 10 3.28 | 19 22 43.7 | 0.3 | 1.3 | 0.09 | 3 | 17 37.3 | 4 30 25.40 | 20 14 37.8 | 0.3 | 1.3 | 0.09 |
| 19 | 8 13.4 | 4 9 59.85 | 19 22 37.9 | 0.3 | 1.3 | 0.09 | 4 | 17 33.4 | 4 30 26.44 | 20 14 37.0 | 0.3 | 1.3 | 0.09 |
| 20 | 8 9.5 | 4 9 56.55 | 19 22 32.4 | 0.3 | 1.3 | 0.09 | 5 | 17 29.5 | 4 30 27.34 | 20 14 36.0 | 0.3 | 1.3 | 0.09 |
| 21 | 8 5.5 | 4 9 53.38 | +19 22 27.3 | 0.3 | 1.3 | 0.09 | 6 | 17 25.6 | 4 30 28.10 | +20 14 34.7 | 0.3 | 1.3 | 0.09 |
| 22 | 8 1.5 | 4 9 50.33 | 19 22 22.6 | 0.3 | 1.3 | 0.09 | 7 | 17 21.7 | 4 30 28.71 | 20 14 33.0 | 0.3 | 1.3 | 0.09 |
| 23 | 7 57.5 | 4 9 47.41 | 19 22 18.3 | 0.3 | 1.3 | 0.09 | 8 | 17 17.7 | 4 30 29.19 | 20 14 31.1 | 0.3 | 1.3 | 0.09 |
| 24 | 7 53.5 | 4 9 44.62 | 19 22 14.3 | 0.3 | 1.3 | 0.09 | 9 | 17 13.8 | 4 30 29.52 | 20 14 28.9 | 0.3 | 1.3 | 0.09 |
| 25 | 7 49.6 | 4 9 41.96 | 19 22 10.7 | 0.3 | 1.3 | 0.09 | 10 | 17 9.9 | 4 30 29.71 | 20 14 26.3 | 0.3 | 1.3 | 0.09 |
| 26 | 7 45.6 | 4 9 39.44 | +19 22 7.4 | 0.3 | 1.3 | 0.09 | 11 | 17 6.0 | 4 30 29.77 | +20 14 23.5 | 0.3 | 1.3 | 0.09 |
| 27 | 7 41.6 | 4 9 37.05 | 19 22 4.5 | 0.3 | 1.3 | 0.09 | 12 | 17 2.0 | 4 30 29.69 | 20 14 20.3 | 0.3 | 1.3 | 0.09 |
| 28 | 7 37.6 | 4 9 34.79 | 19 22 2.0 | 0.3 | 1.3 | 0.09 | 13 | 16 58.1 | 4 30 29.47 | 20 14 16.9 | 0.3 | 1.3 | 0.09 |
| 29 | 7 33.7 | 4 9 32.67 | 19 21 59.9 | 0.3 | 1.3 | 0.09 | 14 | 16 54.2 | 4 30 29.11 | 20 14 13.2 | 0.3 | 1.3 | 0.09 |
| 30 | 7 29.7 | 4 9 30.68 | 19 21 58.1 | 0.3 | 1.3 | 0.09 | 15 | 16 50.2 | 4 30 28.60 | 20 14 9.2 | 0.3 | 1.3 | 0.09 |
| 31 | 7 25.7 | 4 9 28.83 | +19 21 56.7 | 0.3 | 1.3 | 0.09 | 16 | 16 46.3 | 4 30 27.96 | +20 14 4.9 | 0.3 | 1.3 | 0.09 |
| Feb. 1 | 7 21.8 | 4 9 27.11 | 19 21 55.7 | 0.3 | 1.3 | 0.09 | 17 | 16 42.3 | 4 30 27.19 | 20 14 0.4 | 0.3 | 1.3 | 0.09 |
| 2 | 7 17.8 | 4 9 25.53 | 19 21 55.1 | 0.3 | 1.3 | 0.09 | 18 | 16 38.4 | 4 30 26.27 | 20 13 55.5 | 0.3 | 1.3 | 0.09 |
| 3 | 7 13.9 | 4 9 24.09 | 19 21 54.8 | 0.3 | 1.3 | 0.09 | 19 | 16 34.4 | 4 30 25.22 | 20 13 50.4 | 0.3 | 1.3 | 0.09 |
| 4 | 7 9.9 | 4 9 22.80 | 19 21 55.0 | 0.3 | 1.3 | 0.09 | 20 | 16 30.5 | 4 30 24.03 | 20 13 44.9 | 0.3 | 1.3 | 0.09 |
| 5 | 7 6.0 | 4 9 21.64 | +19 21 55.6 | 0.3 | 1.3 | 0.09 | 21 | 16 26.5 | 4 30 22.70 | +20 13 39.2 | 0.3 | 1.3 | 0.09 |
| 6 | 7 2.0 | 4 9 20.63 | 19 21 56.6 | 0.3 | 1.3 | 0.09 | 22 | 16 22.6 | 4 30 21.23 | 20 13 33.2 | 0.3 | 1.3 | 0.09 |
| 7 | 6 58.1 | 4 9 19.76 | 19 21 57.9 | 0.3 | 1.3 | 0.09 | 23 | 16 18.6 | 4 30 19.63 | 20 13 26.9 | 0.3 | 1.3 | 0.09 |
| 8 | 6 54.1 | 4 9 19.03 | 19 21 59.7 | 0.3 | 1.3 | 0.09 | 24 | 16 14.6 | 4 30 17.89 | 20 13 20.4 | 0.3 | 1.3 | 0.09 |
| 9 | 6 50.2 | 4 9 18.43 | 19 22 1.8 | 0.3 | 1.3 | 0.09 | 25 | 16 10.7 | 4 30 16.02 | 20 13 13.6 | 0.3 | 1.3 | 0.09 |
| 10 | 6 46.2 | 4 9 17.99 | +19 22 4.3 | 0.3 | 1.3 | 0.09 | 26 | 16 6.7 | 4 30 14.02 | +20 13 6.5 | 0.3 | 1.3 | 0.09 |
| 11 | 6 42.3 | 4 9 17.70 | 19 22 7.2 | 0.3 | 1.3 | 0.09 | 27 | 16 2.7 | 4 30 11.88 | 20 12 59.1 | 0.3 | 1.3 | 0.09 |
| 12 | 6 38.4 | 4 9 17.54 | 19 22 10.5 | 0.3 | 1.3 | 0.09 | 28 | 15 58.8 | 4 30 9.61 | 20 12 51.4 | 0.3 | 1.3 | 0.09 |
| 13 | 6 34.4 | 4 9 17.53 | 19 22 14.2 | 0.3 | 1.3 | 0.09 | 29 | 15 54.8 | 4 30 7.20 | 20 12 43.5 | 0.3 | 1.3 | 0.09 |
| 14 | 6 30.5 | 4 9 17.66 | 19 22 18.3 | 0.3 | 1.3 | 0.09 | 30 | 15 50.8 | 4 30 4.65 | 20 12 35.3 | 0.3 | 1.3 | 0.09 |
| 15 | 6 26.6 | 4 9 17.94 | +19 22 22.8 | 0.3 | 1.3 | 0.09 | Oct. 1 | 15 46.8 | 4 30 1.98 | +20 12 26.8 | 0.3 | 1.3 | 0.09 |
| 16 | 6 22.7 | 4 9 18.36 | +19 22 27.6 | 0.3 | 1.3 | 0.09 | 2 | 15 42.9 | 4 29 59.18 | +20 12 18.1 | 0.3 | 1.3 | 0.09 |

FOR TRANSIT AT WASHINGTON.

| Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi-diam. | S.T. of Sem. Pass. Mer. | Date. | Mean Time of Transit. | Apparent R. Ascension at Transit. | Apparent Declination at Transit. | Hor. Par. | Semi-diam. | S.T. of Sem. Pass. Mer. |
|--------|-----------------------|-----------------------------------|----------------------------------|-----------|------------|-------------------------|---------|-----------------------|-----------------------------------|----------------------------------|-----------|------------|-------------------------|
| | h m | h m s | ° ' " | " | " | s | | h m | h m s | ° ' " | " | " | s |
| Oct. 1 | 15 46.8 | 4 30 1.98 | +20 12 26.8 | 0.3 | 1.3 | 0.09 | Nov. 16 | 12 43.1 | 4 26 4.73 | +20 2 22.9 | 0.3 | 1.3 | 0.09 |
| 2 | 15 42.9 | 4 29 59.18 | 20 12 18.1 | 0.3 | 1.3 | 0.09 | 17 | 12 38.0 | 4 25 57.83 | 20 2 6.8 | 0.3 | 1.3 | 0.09 |
| 3 | 15 38.9 | 4 29 56.26 | 20 12 9.2 | 0.3 | 1.3 | 0.09 | 18 | 12 34.0 | 4 25 50.90 | 20 1 50.7 | 0.3 | 1.3 | 0.09 |
| 4 | 15 34.9 | 4 29 53.21 | 20 12 0.0 | 0.3 | 1.3 | 0.09 | 19 | 12 29.9 | 4 25 43.95 | 20 1 34.6 | 0.3 | 1.3 | 0.09 |
| 5 | 15 30.9 | 4 29 50.03 | 20 11 50.6 | 0.3 | 1.3 | 0.09 | 20 | 12 25.9 | 4 25 36.98 | 20 1 18.5 | 0.3 | 1.3 | 0.09 |
| 6 | 15 26.9 | 4 29 46.73 | +20 11 40.9 | 0.3 | 1.3 | 0.09 | 21 | 12 21.8 | 4 25 29.97 | +20 1 2.4 | 0.3 | 1.3 | 0.09 |
| 7 | 15 22.9 | 4 29 43.30 | 20 11 30.9 | 0.3 | 1.3 | 0.09 | 22 | 12 17.8 | 4 25 22.94 | 20 0 46.2 | 0.3 | 1.3 | 0.09 |
| 8 | 15 19.0 | 4 29 39.74 | 20 11 20.7 | 0.3 | 1.3 | 0.09 | 23 | 12 13.7 | 4 25 15.89 | 20 0 30.1 | 0.3 | 1.3 | 0.09 |
| 9 | 15 15.0 | 4 29 36.07 | 20 11 10.3 | 0.3 | 1.3 | 0.09 | 24 | 12 9.7 | 4 25 8.81 | 20 0 13.9 | 0.3 | 1.3 | 0.09 |
| 10 | 15 11.0 | 4 29 32.28 | 20 10 59.7 | 0.3 | 1.3 | 0.09 | 25 | 12 5.6 | 4 25 1.71 | 19 59 57.7 | 0.3 | 1.3 | 0.09 |
| 11 | 15 7.0 | 4 29 28.38 | +20 10 48.9 | 0.3 | 1.3 | 0.09 | 26 | 12 1.6 | 4 24 54.60 | +19 59 41.5 | 0.3 | 1.3 | 0.09 |
| 12 | 15 3.0 | 4 29 24.36 | 20 10 37.8 | 0.3 | 1.3 | 0.09 | 27 | 11 57.5 | 4 24 47.49 | 19 59 25.4 | 0.3 | 1.3 | 0.09 |
| 13 | 14 59.0 | 4 29 20.23 | 20 10 26.5 | 0.3 | 1.3 | 0.09 | 28 | 11 53.5 | 4 24 40.38 | 19 59 9.3 | 0.3 | 1.3 | 0.09 |
| 14 | 14 55.0 | 4 29 15.98 | 20 10 15.0 | 0.3 | 1.3 | 0.09 | 29 | 11 49.4 | 4 24 33.27 | 19 58 53.3 | 0.3 | 1.3 | 0.09 |
| 15 | 14 51.0 | 4 29 11.61 | 20 10 3.2 | 0.3 | 1.3 | 0.09 | 30 | 11 45.4 | 4 24 26.15 | 19 58 37.3 | 0.3 | 1.3 | 0.09 |
| 16 | 14 47.0 | 4 29 7.13 | +20 9 51.3 | 0.3 | 1.3 | 0.09 | Dec. 1 | 11 41.3 | 4 24 19.03 | +19 58 21.3 | 0.3 | 1.3 | 0.09 |
| 17 | 14 42.9 | 4 29 2.55 | 20 9 39.1 | 0.3 | 1.3 | 0.09 | 2 | 11 37.3 | 4 24 11.91 | 19 58 5.3 | 0.3 | 1.3 | 0.09 |
| 18 | 14 38.9 | 4 28 57.86 | 20 9 26.8 | 0.3 | 1.3 | 0.09 | 3 | 11 33.2 | 4 24 4.79 | 19 57 49.5 | 0.3 | 1.3 | 0.09 |
| 19 | 14 34.9 | 4 28 53.08 | 20 9 14.3 | 0.3 | 1.3 | 0.09 | 4 | 11 29.2 | 4 23 57.70 | 19 57 33.7 | 0.3 | 1.3 | 0.09 |
| 20 | 14 30.9 | 4 28 48.19 | 20 9 1.6 | 0.3 | 1.3 | 0.09 | 5 | 11 25.1 | 4 23 50.63 | 19 57 18.1 | 0.3 | 1.3 | 0.09 |
| 21 | 14 26.9 | 4 28 43.20 | +20 8 48.7 | 0.3 | 1.3 | 0.09 | 6 | 11 21.1 | 4 23 43.58 | +19 57 2.5 | 0.3 | 1.3 | 0.09 |
| 22 | 14 22.9 | 4 28 38.11 | 20 8 35.6 | 0.3 | 1.3 | 0.09 | 7 | 11 17.0 | 4 23 36.54 | 19 56 47.0 | 0.3 | 1.3 | 0.09 |
| 23 | 14 18.9 | 4 28 32.91 | 20 8 23.3 | 0.3 | 1.3 | 0.09 | 8 | 11 13.0 | 4 23 29.53 | 19 56 31.6 | 0.3 | 1.3 | 0.09 |
| 24 | 14 14.8 | 4 28 27.61 | 20 8 8.8 | 0.3 | 1.3 | 0.09 | 9 | 11 8.9 | 4 23 22.54 | 19 56 16.3 | 0.3 | 1.3 | 0.09 |
| 25 | 14 10.8 | 4 28 22.23 | 20 7 55.2 | 0.3 | 1.3 | 0.09 | 10 | 11 4.9 | 4 23 15.57 | 19 56 1.0 | 0.3 | 1.3 | 0.09 |
| 26 | 14 6.8 | 4 28 16.76 | +20 7 41.4 | 0.3 | 1.3 | 0.09 | 11 | 11 0.8 | 4 23 8.63 | +19 55 45.9 | 0.3 | 1.3 | 0.09 |
| 27 | 14 2.8 | 4 28 11.20 | 20 7 27.5 | 0.3 | 1.3 | 0.09 | 12 | 10 56.8 | 4 23 1.74 | 19 55 30.9 | 0.3 | 1.3 | 0.09 |
| 28 | 13 58.8 | 4 28 5.55 | 20 7 13.4 | 0.3 | 1.3 | 0.09 | 13 | 10 52.7 | 4 22 54.89 | 19 55 16.1 | 0.3 | 1.3 | 0.09 |
| 29 | 13 54.7 | 4 27 59.82 | 20 6 59.1 | 0.3 | 1.3 | 0.09 | 14 | 10 48.7 | 4 22 48.08 | 19 55 1.4 | 0.3 | 1.3 | 0.09 |
| 30 | 13 50.7 | 4 27 54.00 | 20 6 44.7 | 0.3 | 1.3 | 0.09 | 15 | 10 44.6 | 4 22 41.30 | 19 54 46.9 | 0.3 | 1.3 | 0.09 |
| 31 | 13 46.7 | 4 27 48.10 | +20 6 30.1 | 0.3 | 1.3 | 0.09 | 16 | 10 40.6 | 4 22 34.57 | +19 54 32.5 | 0.3 | 1.3 | 0.09 |
| Nov. 1 | 13 42.6 | 4 27 42.11 | 20 6 15.4 | 0.3 | 1.3 | 0.09 | 17 | 10 36.6 | 4 22 27.89 | 19 54 18.3 | 0.3 | 1.3 | 0.09 |
| 2 | 13 38.6 | 4 27 36.05 | 20 6 0.6 | 0.3 | 1.3 | 0.09 | 18 | 10 32.5 | 4 22 21.25 | 19 54 4.2 | 0.3 | 1.3 | 0.09 |
| 3 | 13 34.6 | 4 27 29.92 | 20 5 45.7 | 0.3 | 1.3 | 0.09 | 19 | 10 28.5 | 4 22 14.66 | 19 53 50.2 | 0.3 | 1.3 | 0.09 |
| 4 | 13 30.5 | 4 27 23.73 | 20 5 30.6 | 0.3 | 1.3 | 0.09 | 20 | 10 24.4 | 4 22 8.14 | 19 53 36.5 | 0.3 | 1.3 | 0.09 |
| 5 | 13 26.5 | 4 27 17.47 | +20 5 15.4 | 0.3 | 1.3 | 0.09 | 21 | 10 20.4 | 4 22 1.67 | +19 53 23.0 | 0.3 | 1.3 | 0.09 |
| 6 | 13 22.5 | 4 27 11.14 | 20 5 0.1 | 0.3 | 1.3 | 0.09 | 22 | 10 16.4 | 4 21 55.27 | 19 53 9.6 | 0.3 | 1.3 | 0.09 |
| 7 | 13 18.4 | 4 27 4.74 | 20 4 44.8 | 0.3 | 1.3 | 0.09 | 23 | 10 12.3 | 4 21 48.94 | 19 52 56.4 | 0.3 | 1.3 | 0.09 |
| 8 | 13 14.4 | 4 26 58.27 | 20 4 29.3 | 0.3 | 1.3 | 0.09 | 24 | 10 8.3 | 4 21 42.67 | 19 52 43.4 | 0.3 | 1.3 | 0.09 |
| 9 | 13 10.4 | 4 26 51.74 | 20 4 13.7 | 0.3 | 1.3 | 0.09 | 25 | 10 4.2 | 4 21 36.46 | 19 52 30.7 | 0.3 | 1.3 | 0.09 |
| 10 | 13 6.3 | 4 26 45.17 | +20 3 58.1 | 0.3 | 1.3 | 0.09 | 26 | 10 0.2 | 4 21 30.31 | +19 52 18.1 | 0.3 | 1.3 | 0.09 |
| 11 | 13 2.3 | 4 26 38.55 | 20 3 42.4 | 0.3 | 1.3 | 0.09 | 27 | 9 56.2 | 4 21 24.25 | 19 52 5.7 | 0.3 | 1.3 | 0.09 |
| 12 | 12 58.2 | 4 26 31.88 | 20 3 26.6 | 0.3 | 1.3 | 0.09 | 28 | 9 52.2 | 4 21 18.26 | 19 51 53.6 | 0.3 | 1.3 | 0.09 |
| 13 | 12 54.2 | 4 26 25.16 | 20 3 10.8 | 0.3 | 1.3 | 0.09 | 29 | 9 48.1 | 4 21 12.36 | 19 51 41.7 | 0.3 | 1.3 | 0.09 |
| 14 | 12 50.2 | 4 26 18.40 | 20 2 54.9 | 0.3 | 1.3 | 0.09 | 30 | 9 44.1 | 4 21 6.54 | 19 51 30.0 | 0.3 | 1.3 | 0.09 |
| 15 | 12 46.1 | 4 26 11.59 | +20 2 39.0 | 0.3 | 1.3 | 0.09 | 31 | 9 40.1 | 4 21 0.81 | +19 51 18.6 | 0.3 | 1.3 | 0.09 |
| 16 | 12 42.1 | 4 26 4.73 | +20 2 22.9 | 0.3 | 1.3 | 0.09 | 32 | 9 36.1 | 4 20 55.16 | +19 51 7.4 | 0.3 | 1.3 | 0.09 |

PART III

P H E N O M E N A

ECLIPSES IN 1891.

In the year 1891 there will be four eclipses, two of the sun and two of the moon, and a Transit of Mercury over the Sun's Disk.

I.—*A Total Eclipse of the Moon*, 1891, May 23, invisible at Washington, but visible generally throughout the western part of the Pacific Ocean, Australia, Asia, Africa and Europe.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, May 23 ^d 6 ^h 18 ^m 53.7 ^s

| | | | |
|----------------------------|--|--------------------------|--------------------|
| Sun's right ascension | ^h 4 ^m 0 ^s 49.54 | Hourly motion | ^s 10.06 |
| Moon's right ascension | 16 0 49.54 | Hourly motion | 133.91 |
| Sun's declination | 20° 37' 56.2" N. | Hourly motion | 0' 28.5" N. |
| Moon's declination | 20 20 12.7 S. | Hourly motion | 9 24.1 S. |
| Sun's equa. hor. parallax | 8.5 | Sun's true semidiameter | 15 47.5 |
| Moon's equa. hor. parallax | 56 47.1 | Moon's true semidiameter | 15 27.7 |

TIMES OF THE PHASES.

| | | |
|-----------------------|--|------------------------|
| Moon enters penumbra | May 23 ^d 3 ^h 36.1 ^m | } Greenwich Mean Time. |
| Moon enters shadow | 23 4 41.3 | |
| Total eclipse begins | 23 5 49.3 | |
| Middle of the eclipse | 23 6 29.2 | |
| Total eclipse ends | 23 7 9.1 | |
| Moon leaves shadow | 23 8 17.3 | |
| Moon leaves penumbra | 23 9 23.0 | |

CIRCUMSTANCES OF THE ECLIPSE.

| Contacts of Shadow with moon's limb. | Angles of position from north point. | The moon being in the zenith in longitude from Greenwich and in latitude. | |
|---|---|--|-----------|
| First | 125° to E. | 107° 58' E. | 20° 5' S. |
| Last | 90 to W. | 55 49 E. | 20 39 S. |

Magnitude of the eclipse = 1.306, (moon's diameter = 1).

II.—*An Annular Eclipse of the Sun*, 1891, June 6, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, June 6 ^d 4 ^h 37 ^m 58.6 ^s

| | | | |
|----------------------------|---|--------------------------|-------------------------------|
| Sun and moon's R. A. | ^h 4 ^m 57 ^s 37.39 | Hourly motions | ^s 10.31 and 143.97 |
| Sun's declination | 22° 40' 47.4" N. | Hourly motion | 0' 15.4" N. |
| Moon's declination | 23 37 57.8 N. | Hourly motion | 6 36.3 N. |
| Sun's equa. hor. parallax | 8.4 | Sun's true semidiameter | 15 45.5 |
| Moon's equa. hor. parallax | 57 32.1 | Moon's true semidiameter | 15 39.9 |

CIRCUMSTANCES OF THE ECLIPSE.

| | Greenwich Mean Time. | Longitude from Greenwich. | Latitude. |
|-------------------------|---|------------------------------|------------|
| Eclipse begins | June ^d 6 ^h 2 ^m 3.3 | 132° 32.0 W. | 25° 8.3 N. |
| Central eclipse begins | 6 3 52.6 | 170 19.5 E. | 57 34.5 N. |
| Central eclipse at noon | 6 4 38.0 | 110 6.6 E. | 69 50.2 N. |
| Central eclipse ends | 6 4 38.5 | 109 17.6 E. | 67 19.3 N. |
| Eclipse ends | 6 6 27.8 | 18 7.2 E. | 45 48.7 N. |

III.—*A Total Eclipse of the Moon*, 1891, November 15, visible at Washington, and generally visible in Asia, Africa, Europe, the Atlantic Ocean, North and South America, and the eastern part of the Pacific Ocean.

ELEMENTS OF THE ECLIPSE.

| | | | | | | | |
|--|---|---|---|-----|-----|-------|------------|
| Greenwich mean time of δ in right ascension, November | | | | d | h | m | s |
| | | | | 15 | 12 | 8 | 44.8 |
| Sun's right ascension | h | m | s | 15 | 23 | 54.99 | |
| Moon's right ascension | h | m | s | 3 | 23 | 54.99 | |
| Sun's declination | | | | 18 | 37 | 41.1 | S. |
| Moon's declination | | | | 18 | 21 | 5.5 | N. |
| Sun's equa. hor. parallax | | | | 8.7 | | | |
| Moon's equa. hor. parallax | | | | 60 | 3.2 | | |
| Hourly motion | | | | | | | 10.29 |
| Hourly motion | | | | | | | 145.10 |
| Hourly motion | | | | | | | 0' 37.9 S. |
| Hourly motion | | | | | | | 12 23.6 N. |
| Sun's true semidiameter | | | | | | | 16 10.9 |
| Moon's true semidiameter | | | | | | | 16 21.1 |

TIMES OF THE PHASES.

| | | | | |
|-----------------------|----------|----|----|------|
| | d | h | m | |
| Moon enters penumbra | November | 15 | 9 | 35.9 |
| Moon enters shadow | | 15 | 10 | 35.0 |
| Total eclipse begins | | 15 | 11 | 37.0 |
| Middle of the eclipse | | 15 | 12 | 18.8 |
| Total eclipse ends | | 15 | 13 | 0.7 |
| Moon leaves shadow | | 15 | 14 | 3.0 |
| Moon leaves penumbra | | 15 | 15 | 2.6 |

Greenwich Mean Time.

CIRCUMSTANCES OF THE ECLIPSE.

| | | | |
|---|---|--|-----------|
| Contacts of Shadow with moon's limb. | Angles of position from north point. | The moon being in the zenith in longitude from Greenwich and in latitude. | |
| First | 55° to E. | 16° 34' E. | 18° 2' N. |
| Last | 95 to W. | 33 32 W. | 18 43 N. |

Magnitude of the eclipse = 1.393, (moon's diameter = 1).

IV.—*A Partial Eclipse of the Sun*, 1891, November 30—December 1, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

| | | | | | | | |
|--|---|---|---|-----|------|-------|------------------|
| Greenwich mean time of δ in right ascension, 1891, December | | | | d | h | m | s |
| | | | | 1 | 0 | 7 | 46.9 |
| Sun and moon's R. A. | h | m | s | 16 | 29 | 22.94 | |
| Sun's declination | | | | 21 | 49 | 15.7 | S. |
| Moon's declination | | | | 23 | 1 | 22.9 | S. |
| Sun's equa. hor. parallax | | | | 8.7 | | | |
| Moon's equa. hor. parallax | | | | 55 | 56.9 | | |
| Hourly motion | | | | | | | 10.80 and 134.25 |
| Hourly motion | | | | | | | 0' 23.3 S. |
| Hourly motion | | | | | | | 7 40.7 S. |
| Sun's true semidiameter | | | | | | | 16 13.7 |
| Moon's true semidiameter | | | | | | | 15 14.0 |

CIRCUMSTANCES OF THE ECLIPSE.

| | | | | |
|------------------|----------|------------|------------------------------|-------------|
| | | | Longitude from Greenwich. | Latitude. |
| Eclipse begins | November | d h m | 75° 31.5 W. | 35° 45.0 S. |
| Greatest eclipse | | 30 23 31.2 | 141 0.9 W. | 64 6.5 S. |
| Eclipse ends | December | 1 1 17.8 | 110 7.6 E. | 59 14.0 S. |

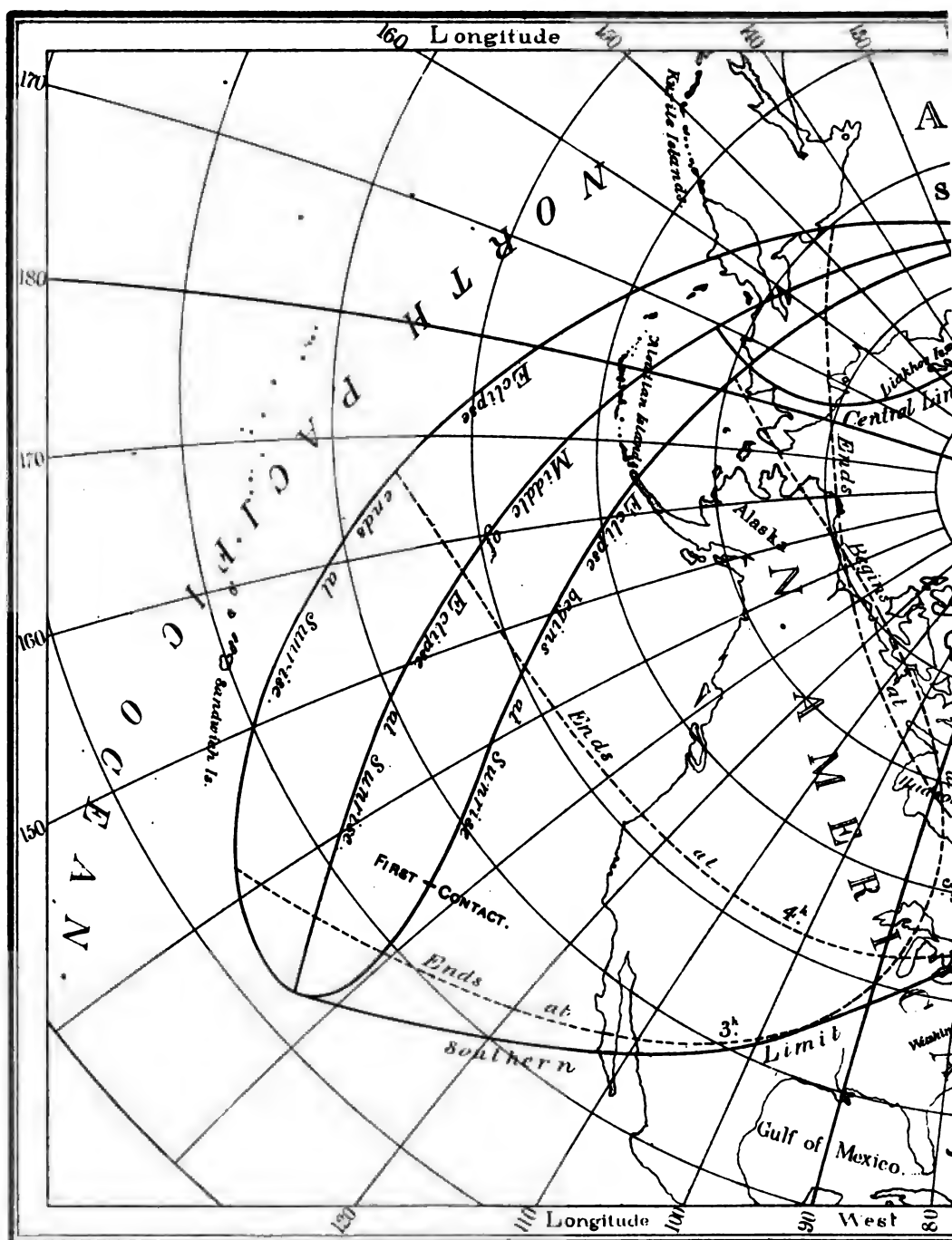
Magnitude of greatest eclipse = 0.531, (sun's diameter = 1).

The regions within which the eclipses of the sun are visible, are laid down on the accompanying charts, from which, by means of the dotted lines, the Greenwich times of beginning and ending, within fifteen or twenty minutes, may also be found.

BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE
OF THE SUN, 1891, JUNE 6.

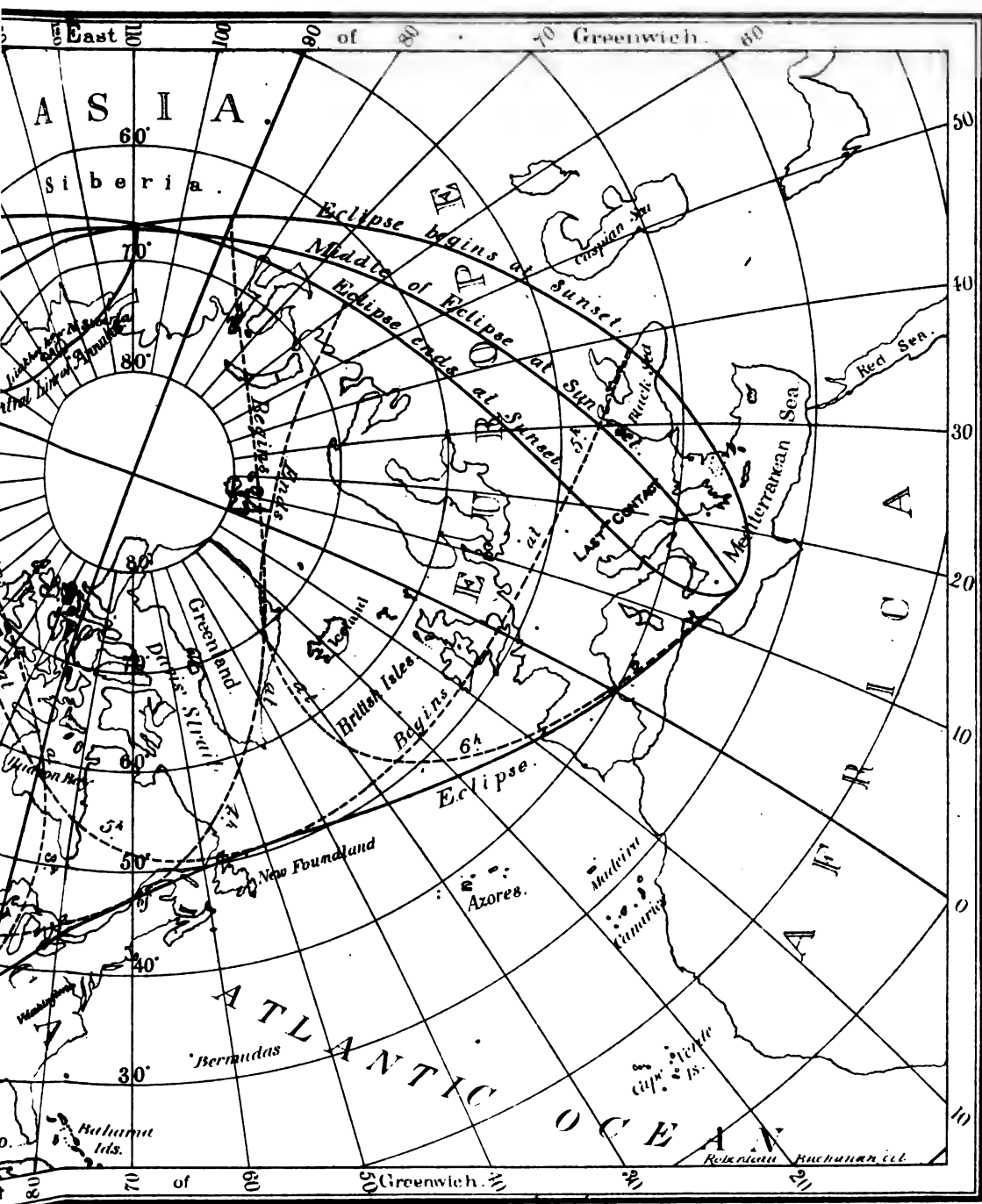
| Greenwich Mean Time. | Co-ordinates of Centre of Shadow on Fundamental Plane. | | Direction of Axis of Shadow. | | | Radius of Penumbra and Shadow on Fundamental Plane. | |
|----------------------------|--|----------|------------------------------------|------------------|------------------------------------|---|----------------------------------|
| | <i>x</i> | <i>y</i> | Log sin <i>d</i> | Log cos <i>d</i> | <i>μ</i> | <i>l</i> | <i>l'</i> |
| ^h 2 0 | -1.40416 | +0.70249 | +9.58588 | +9.96509 | 30° 23.8 | +0.54712 | +0.00124 |
| 10 | 1.31529 | 0.72116 | 9.58589 | 9.96509 | 32 53.8 | 0.54715 | 0.00127 |
| 20 | 1.22642 | 0.73982 | 9.58591 | 9.96509 | 35 23.8 | 0.54717 | 0.00129 |
| 30 | 1.13755 | 0.75847 | 9.58592 | 9.96508 | 37 53.8 | 0.54720 | 0.00132 |
| 40 | 1.04868 | 0.77711 | 9.58593 | 9.96508 | 40 23.8 | 0.54722 | 0.00134 |
| 50 | 0.95980 | 0.79574 | 9.58594 | 9.96508 | 42 53.8 | 0.54725 | 0.00137 |
| 3 0 | -0.87092 | +0.81435 | +9.58595 | +9.96508 | 45 23.7 | +0.54727 | +0.00139 |
| 10 | 0.78204 | 0.83295 | 9.58597 | 9.96507 | 47 53.7 | 0.54730 | 0.00142 |
| 20 | 0.69316 | 0.85154 | 9.58598 | 9.96507 | 50 23.7 | 0.54732 | 0.00144 |
| 30 | 0.60427 | 0.87012 | 9.58599 | 9.96507 | 52 53.7 | 0.54735 | 0.00147 |
| 40 | 0.51538 | 0.88870 | 9.58600 | 9.96507 | 55 23.7 | 0.54737 | 0.00149 |
| 50 | 0.42649 | 0.90727 | 9.58601 | 9.96507 | 57 53.7 | 0.54739 | 0.00151 |
| 4 0 | -0.33760 | +0.92582 | +9.58603 | +9.96506 | 60 23.7 | +0.54741 | +0.00153 |
| 10 | 0.24871 | 0.94436 | 9.58604 | 9.96506 | 62 53.7 | 0.54743 | 0.00155 |
| 20 | 0.15982 | 0.96289 | 9.58605 | 9.96506 | 65 23.7 | 0.54745 | 0.00157 |
| 30 | -0.07093 | 0.98141 | 9.58606 | 9.96506 | 67 53.7 | 0.54747 | 0.00159 |
| 40 | +0.01797 | 0.99992 | 9.58607 | 9.96506 | 70 23.7 | 0.54749 | 0.00161 |
| 50 | 0.10687 | 1.01842 | 9.58609 | 9.96505 | 72 53.7 | 0.54751 | 0.00163 |
| 5 0 | +0.19577 | +1.03690 | +9.58610 | +9.96505 | 75 23.7 | +0.54752 | +0.00164 |
| 10 | 0.28466 | 1.05538 | 9.58611 | 9.96505 | 77 53.7 | 0.54754 | 0.00166 |
| 20 | 0.37356 | 1.07385 | 9.58612 | 9.96505 | 80 23.7 | 0.54755 | 0.00167 |
| 30 | 0.46246 | 1.09231 | 9.58613 | 9.96504 | 82 53.7 | 0.54757 | 0.00169 |
| 40 | 0.55135 | 1.11075 | 9.58615 | 9.96504 | 85 23.7 | 0.54758 | 0.00170 |
| 50 | 0.64025 | 1.12918 | 9.58616 | 9.96504 | 87 53.7 | 0.54760 | 0.00172 |
| 6 0 | +0.72914 | +1.14760 | +9.58617 | +9.96504 | 90 23.6 | +0.54761 | +0.00173 |
| 10 | 0.81803 | 1.16601 | 9.58618 | 9.96504 | 92 53.6 | 0.54763 | 0.00175 |
| 20 | 0.90692 | 1.18440 | 9.58619 | 9.96503 | 95 23.6 | 0.54764 | 0.00176 |
| 30 | +0.99581 | +1.20278 | +9.58621 | +9.96503 | 97 53.6 | +0.54765 | +0.00177 |
| | | | | | | | |
| Greenwich Mean Time. | Log Δ <i>x</i> for 1 Minute. | | Log Δ <i>y</i> for 1 Minute. | | Log Δ <i>μ</i> for 1 Minute. | | Log Tangents of Angles of Cones— |
| | | | | | | | Penumbra. Shadow. |
| ^h 2 0 | +7.9487 | | +7.2713 | | +1.1761 | | +7.66336 +7.66125 |
| 3 0 | 7.9488 | | 7.2697 | | 1.1761 | | 7.66336 7.66124 |
| 4 0 | 7.9488 | | 7.2682 | | 1.1761 | | 7.66336 7.66124 |
| 5 0 | 7.9489 | | 7.2667 | | 1.1761 | | 7.66335 7.66124 |
| 6 0 | 7.9488 | | 7.2652 | | 1.1761 | | 7.66335 7.66124 |
| 7 0 | +7.9488 | | +7.2635 | | +1.1761 | | +7.66335 +7.66124 |

ANNULAR ECLIPSE



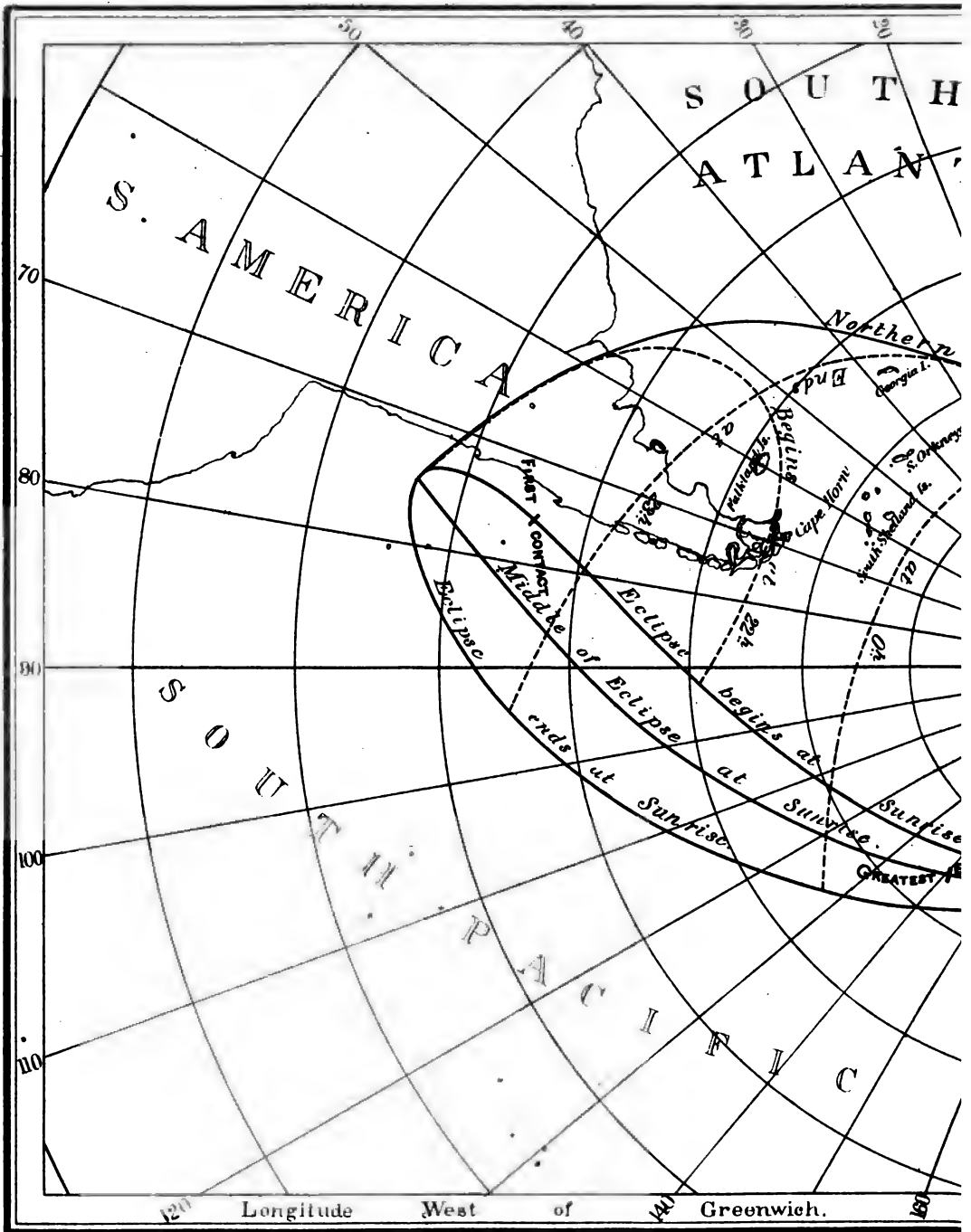
Note.—The hours of beginning and end

ECLIPSE OF JUNE 6TH 1891.



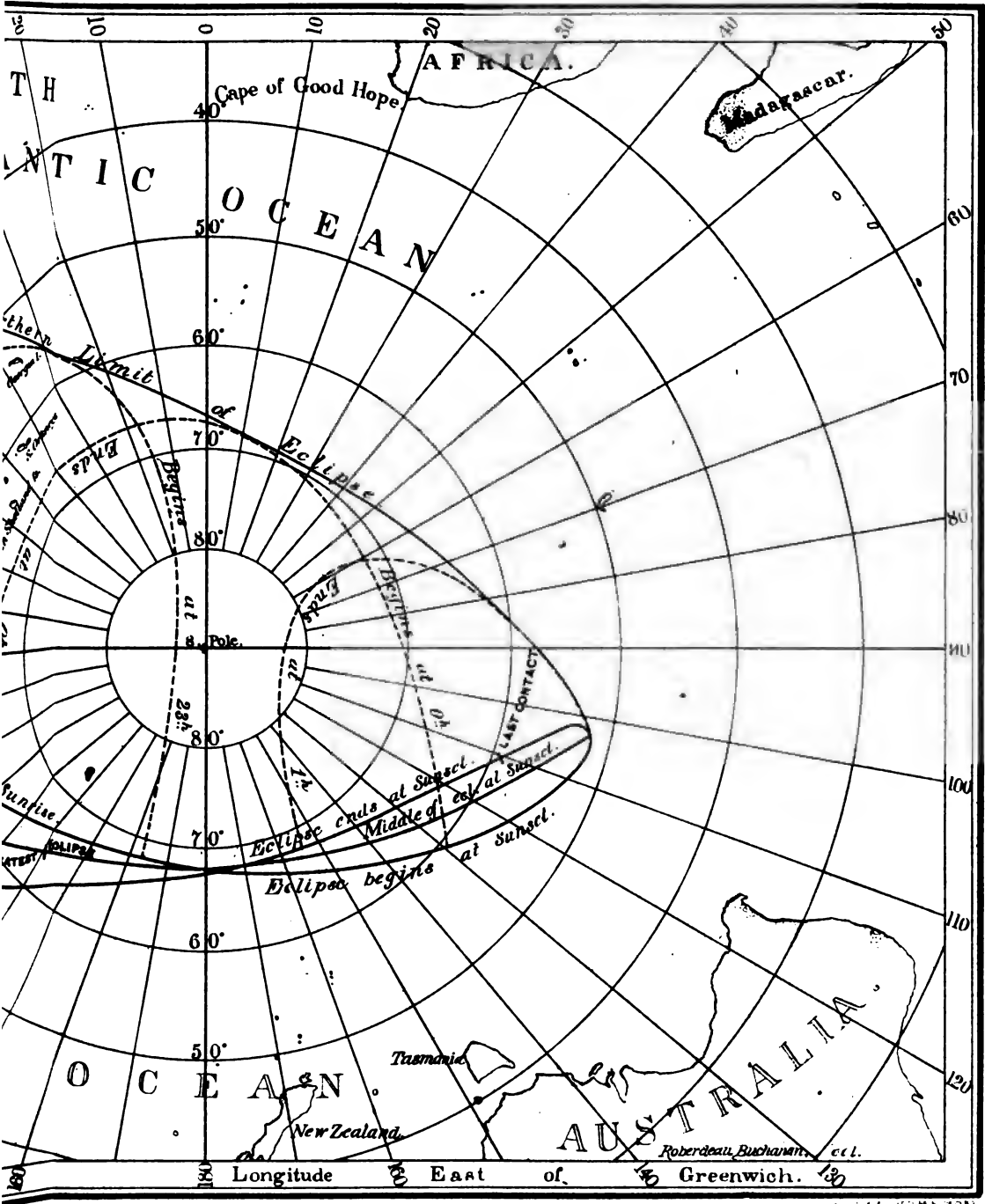
and ending are expressed in Greenwich Mean Time.

PARTIAL ECLIPSE OF N



Note.—The hours of beginning and end

OF NOV. 30TH - DEC. 1ST 1891.



and ending are expressed in Greenwich Mean Time.

**BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE
OF THE SUN, 1891, NOVEMBER 30—DECEMBER 1.**

| Greenwich Mean Time. | Co-ordinates of Centre of Shadow on Fundamental Plane. | | Direction of Axis of Shadow. | | | Radius of Penumbra on Fundamental Plane. |
|---------------------------------------|--|----------|------------------------------|------------------|----------|--|
| | <i>z</i> | <i>y</i> | Log sin <i>d</i> | Log cos <i>d</i> | μ | <i>l</i> |
| ^h 21 ^m 40 | -1.25340 | -0.97072 | -9.56985 | +9.96777 | 327° 43' | +0.56395 |
| 50 | 1.16861 | 0.99256 | 9.56987 | 9.96777 | 330 13.3 | 0.56394 |
| 22 0 | -1.08382 | -1.01439 | -9.56989 | +9.96776 | 332 43.3 | +0.56394 |
| 10 | 0.99902 | 1.03620 | 9.56991 | 9.96776 | 335 13.3 | 0.56393 |
| 20 | 0.91422 | 1.05800 | 9.56993 | 9.96776 | 337 43.2 | 0.56391 |
| 30 | 0.82942 | 1.07979 | 9.56995 | 9.96775 | 340 13.2 | 0.56390 |
| 40 | 0.74461 | 1.10158 | 9.56997 | 9.96775 | 342 43.2 | 0.56388 |
| 50 | 0.65980 | 1.12336 | 9.56999 | 9.96775 | 345 13.2 | 0.56387 |
| 23 0 | -0.57499 | -1.14512 | -9.57001 | +9.96774 | 347 43.1 | +0.56385 |
| 10 | 0.49017 | 1.16687 | 9.57003 | 9.96774 | 350 13.1 | 0.56384 |
| 20 | 0.40535 | 1.18861 | 9.57005 | 9.96774 | 352 43.1 | 0.56382 |
| 30 | 0.32052 | 1.21034 | 9.57007 | 9.96773 | 355 13.1 | 0.56381 |
| 40 | 0.23569 | 1.23207 | 9.57009 | 9.96773 | 357 43.0 | 0.56379 |
| 50 | 0.15086 | 1.25379 | 9.57011 | 9.96773 | 0 13.0 | 0.56377 |
| 0 0 | -0.06603 | -1.27549 | -9.57013 | +9.96772 | 2 43.0 | +0.56375 |
| 10 | +0.01881 | 1.29718 | 9.57015 | 9.96772 | 5 12.9 | 0.56373 |
| 20 | 0.10365 | 1.31885 | 9.57017 | 9.96772 | 7 42.9 | 0.56371 |
| 30 | 0.18850 | 1.34051 | 9.57018 | 9.96771 | 10 12.9 | 0.56369 |
| 40 | 0.27335 | 1.36216 | 9.57020 | 9.96771 | 12 42.9 | 0.56367 |
| 50 | 0.35821 | 1.38380 | 9.57022 | 9.96771 | 15 12.8 | 0.56365 |
| 1 0 | +0.44307 | -1.40543 | -9.57024 | +9.96770 | 17 42.8 | +0.56362 |
| 10 | 0.52793 | 1.42704 | 9.57026 | 9.96770 | 20 12.8 | 0.56360 |
| 20 | +0.61279 | -1.44864 | -9.57028 | +9.96770 | 22 42.8 | +0.56357 |

| Greenwich Mean Time. | | Log Δz for 1 Minute. | Log Δy for 1 Minute. | Log $\Delta \mu$ for 1 Minute. | Log Tangent of Angle of Cone— Penumbra. |
|---------------------------------------|---|------------------------------------|------------------------------------|--------------------------------------|---|
| ^h 21 ^m 21 | 0 | +7.9282 | -7.3400 | +1.1760 | +7.67616 |
| 22 | 0 | 7.9284 | 7.3388 | 1.1760 | 7.67616 |
| 23 | 0 | 7.9285 | 7.3376 | 1.1760 | 7.67616 |
| 0 | 0 | 7.9286 | 7.3363 | 1.1760 | 7.67616 |
| 1 | 0 | 7.9287 | 7.3349 | 1.1760 | 7.67616 |
| 2 | 0 | +7.9288 | -7.3336 | +1.1760 | +7.67617 |

A Transit of Mercury over the Sun's Disk, May 9, partly visible at Washington, and visible throughout the western portion of North and South America.

ELEMENTS OF THE TRANSIT.

| | | | | | | | |
|---|----------------|----------------|--------------------|-------------------|----------------------------|-----------------|-------------------|
| Greenwich mean time of δ in right ascension, May | | | | ^d 9 | ^h 15 | ^m 57 | ^s 22.9 |
| Sun and Mercury's R. A. | ^h 3 | ^m 6 | ^s 57.16 | Hourly motions | + 2' 26".20 and - 1' 18".5 | | |
| Sun's declination | + 17° 32' 1".3 | | | Hourly motion | + 39".56 | | |
| Mercury's declination | + 17 18 1.6 | | | Hourly motion | - 66.65 | | |
| Sun's equa. hor. parallax | 8.75 | | | True semidiameter | 15' 52".3 | | |
| Mercury's equa. hor. parallax | 15.86 | | | True semidiameter | 6.0 | | |

TIMES OF THE PHASES.

| | | | | | | |
|---------------------------|-----------|----------------|-----------------|-----------------|-------------------|----------------------|
| Ingress, exterior contact | May | ^d 9 | ^h 11 | ^m 55 | ^s 29.3 | Greenwich Mean Time. |
| Ingress, interior contact | | 9 | 12 | 0 | 25.0 | |
| Least distance of centres | 12' 32".4 | 9 | 14 | 23 | 54.5 | |
| Egress, interior contact | | 9 | 16 | 47 | 2.3 | |
| Egress, exterior contact | | 9 | 16 | 52 | 45.7 | |

CIRCUMSTANCES OF THE TRANSIT.

| Exterior contacts. | Angles of position from north point. | The sun being in the zenith in longitude from Greenwich and in latitude. | |
|--------------------|--------------------------------------|--|------------|
| Ingress | 115° 31' E. | 179° 48' W. | 17° 36' N. |
| Egress | 168 15 W. | 105 53 E. | 17 39 N. |

The Washington mean time of exterior contact at Ingress and Egress for any point on the surface of the earth, may be computed from the following formulæ, in which ρ denotes the radius of the earth at the place, φ the geocentric north latitude and ω the longitude west from Washington.

$$\begin{aligned} \text{Ingress, } T' &= 6^{\text{h}} 47^{\text{m}} 17.26^{\text{s}} + 71.66 \rho \sin \varphi - 157.88 \rho \cos \varphi \cos (20^{\circ} 16' 55.5'' - \omega) \\ \text{Egress, } T'' &= 11^{\text{h}} 44^{\text{m}} 33.69^{\text{s}} - 162.30 \rho \sin \varphi + 60.75 \rho \cos \varphi \cos (212^{\circ} 37' 51.3'' - \omega) \end{aligned}$$

WASHINGTON MEAN TIME.

PHASES OF THE MOON.

| New Moon. | | | | First Quarter. | | | | Full Moon. | | | | Last Quarter. | | | |
|-----------|----|----|------|----------------|----|----|------|------------|----|----|------|---------------|----|----|------|
| | d | h | m | | d | h | m | | d | h | m | | d | h | m |
| January | 9 | 22 | 16.4 | January | 16 | 13 | 9.3 | January | 24 | 7 | 17.1 | January | 2 | 17 | 4.0 |
| February | 8 | 9 | 4.0 | February | 15 | 1 | 21.3 | February | 23 | 2 | 10.2 | February | 1 | 11 | 33.9 |
| March | 9 | 18 | 42.5 | March | 16 | 16 | 2.3 | March | 24 | 20 | 3.7 | March | 3 | 2 | 29.3 |
| April | 8 | 3 | 48.8 | April | 15 | 8 | 32.2 | April | 23 | 11 | 57.0 | April | 1 | 13 | 22.1 |
| May | 7 | 13 | 7.3 | May | 15 | 1 | 56.2 | May | 23 | 1 | 17.7 | April | 30 | 20 | 42.9 |
| June | 5 | 23 | 18.0 | June | 13 | 19 | 25.7 | June | 21 | 12 | 3.9 | May | 30 | 1 | 46.2 |
| July | 5 | 10 | 50.3 | July | 13 | 12 | 20.7 | July | 20 | 20 | 45.9 | June | 28 | 6 | 7.7 |
| August | 4 | 0 | 4.0 | August | 12 | 4 | 3.5 | August | 19 | 4 | 20.1 | July | 27 | 11 | 24.4 |
| September | 2 | 15 | 7.8 | September | 10 | 17 | 59.3 | September | 17 | 11 | 55.6 | August | 25 | 19 | 1.0 |
| October | 2 | 7 | 49.6 | October | 10 | 5 | 48.5 | October | 16 | 20 | 36.8 | September | 24 | 5 | 59.0 |
| November | 1 | 1 | 24.4 | November | 8 | 15 | 38.2 | November | 15 | 7 | 7.9 | October | 23 | 20 | 47.9 |
| November | 30 | 18 | 36.8 | December | 8 | 0 | 5.0 | December | 14 | 19 | 44.4 | November | 22 | 15 | 17.7 |
| December | 30 | 10 | 11.6 | | | | | | | | | December | 22 | 12 | 30.4 |

PERIGEE, APOGEE, AND GREATEST LIBRATION.

| Perigee. | | | Apogee. | | | Greatest Libration. | | | | | | | |
|-----------|----|------|-----------|----|------|---------------------|----|----|-------|-----------|----|----|-------|
| | d | h | | d | h | d | h | m | | d | h | m | |
| January | 11 | 8.7 | January | 26 | 22.7 | January | 5 | 12 | 7 E. | January | 17 | 13 | 0 W. |
| February | 8 | 19.2 | February | 23 | 0.9 | February | 2 | 21 | 4 E. | February | 14 | 14 | 23 W. |
| March | 9 | 7.6 | March | 22 | 4.6 | March | 3 | 3 | 17 E. | March | 15 | 6 | 12 W. |
| April | 6 | 17.1 | April | 18 | 18.3 | March | 31 | 1 | 12 E. | April | 12 | 11 | 48 W. |
| May | 4 | 15.5 | May | 16 | 11.8 | April | 27 | 0 | 36 E. | May | 10 | 11 | 2 W. |
| May | 31 | 3.5 | June | 13 | 6.9 | May | 23 | 7 | 36 E. | June | 6 | 21 | 54 W. |
| June | 25 | 11.7 | July | 11 | 1.3 | June | 19 | 10 | 9 E. | July | 3 | 12 | 36 W. |
| July | 22 | 23.9 | August | 7 | 17.1 | July | 17 | 4 | 8 E. | July | 30 | 0 | 16 W. |
| August | 20 | 3.8 | September | 4 | 3.1 | August | 14 | 6 | 18 E. | August | 26 | 13 | 14 W. |
| September | 17 | 13.3 | October | 1 | 4.7 | September | 11 | 12 | 7 E. | September | 23 | 14 | 57 W. |
| October | 16 | 0.3 | October | 28 | 11.6 | October | 9 | 21 | 8 E. | October | 21 | 21 | 28 W. |
| November | 13 | 8.1 | November | 25 | 3.7 | November | 6 | 9 | 58 E. | November | 19 | 2 | 8 W. |
| December | 11 | 1.0 | December | 23 | 0.9 | December | 2 | 19 | 59 E. | December | 16 | 23 | 10 W. |
| | | | | | | December | 29 | 8 | 22 E. | | | | |

FORMULÆ FOR THE LIBRATION OF THE MOON.

Put I , the inclination of the moon's equator to the ecliptic ($= 1^\circ 28'.8$),

Ω , the mean longitude of the moon's ascending node, (see page 278), or the mean longitude of the descending node of the moon's equator,

C , the angle at the centre of the moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

$\lambda, \beta, a', \delta'$, the apparent longitude, latitude, right ascension, and declination of the moon, corrected for parallax,

λ' , the selenocentric longitude of the earth, counted on the moon's equator from its descending node, Ω ,

$i, \Delta, \Omega', \zeta$, the quantities defined on page 276, where their values for the year are given.

The moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 276 and 277:—

$$\left. \begin{aligned} \Delta \lambda &= -0'.57 \sin 2(\Omega - \lambda) \\ a &= \sin I \cos(\Omega - \lambda) \\ \tan B &= \tan I \sin(\Omega - \lambda) \\ \lambda' &= \lambda + \Delta \lambda + a b \end{aligned} \right\} \text{See table, page 277.}$$

$$\text{The libration in latitude} = b = B - \beta$$

$$\text{The libration in longitude} = l = \lambda' - \zeta$$

$$\sin C = \sin i \frac{\cos(\lambda' + \Delta - \Omega)}{\cos \delta'} = -\sin i \frac{\cos(a' - \Omega)}{\cos b}$$

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

| THE STAR'S | | | | AT CONJUNCTION IN R. A. | | | | | | Limiting Parallels | |
|-------------------------------|------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|---------|-----------------------|-----|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. |
| | | $\Delta\alpha$ | $\Delta\delta$ | | d h m | h m | | | | | |
| ν Virginis | 4.0 | -0.59 | + 2.6 | + 7 8.4 | 1 0 19.4 | + 7 23.4 | +0.7018 | 0.4987 | -0.2238 | +90 | - 3 |
| π Virginis | 4.6 | 0.65 | 2.3 | 7 13.3 | 8 35.7 | - 8 34.0 | -1.2590 | 0.4974 | 0.5282 | -35 | -83 |
| ϵ Virginis | 5.5 | 0.76 | 3.1 | 3 55.2 | 19 22.4 | + 1 55.0 | -0.1046 | 0.4975 | 0.2327 | +36 | -46 |
| B. A. C. 4254 | 6.1 | 0.86 | 3.3 | + 2 27.3 | 2 5 18.1 | +11 34.3 | -0.8174 | 0.4977 | 0.352 | - 2 | -88 |
| 65 Virginis | 6.1 | 1.14 | 4.6 | - 4 21.2 | 3 5 45.3 | +11 20.7 | +0.8371 | 0.5034 | 0.2358 | +86 | + 4 |
| 66 Virginis | 6.0 | -1.14 | + 4.7 | - 4 35.5 | 6 24.4 | +11 58.7 | +0.9439 | 0.5039 | -0.2358 | +85 | +10 |
| ι Virginis | 5.1 | 1.19 | 4.9 | 5 41.5 | 10 22.9 | - 8 9.6 | +1.1970 | 0.5057 | 0.2352 | +84 | +29 |
| 80 Virginis | 6.1 | 1.20 | 4.5 | 4 50.3 | 12 16.4 | - 6 19.4 | -0.1712 | 0.5059 | 0.2346 | +31 | -51 |
| 88 Virginis | 6.8 | 1.28 | 4.8 | 6 17.5 | 19 1.1 | + 0 13.7 | -0.1796 | 0.5091 | 0.2327 | +30 | -51 |
| B. A. C. 4647 <i>mult.</i> | 6.4 | 1.32 | 5.0 | 7 31.2 | 22 30.3 | + 3 36.8 | +0.3352 | 0.5111 | 0.2313 | +59 | -23 |
| 94 Virginis | 6.8 | -1.39 | + 5.0 | - 8 22.2 | 4 4 21.2 | + 9 17.5 | -0.0922 | 0.5139 | -0.2288 | +34 | -48 |
| 95 Virginis | 6.0 | 1.39 | 5.1 | 8 47.5 | 4 34.3 | + 9 30.2 | +0.3036 | 0.5141 | 0.2287 | +56 | -25 |
| 96 Virginis | 6.9 | 1.41 | 5.2 | 9 49.0 | 5 43.9 | +10 37.7 | +1.1380 | 0.5153 | 0.2281 | +80 | +25 |
| κ Virginis | 4.2 | 1.43 | 5.2 | 9 45.9 | 7 43.1 | -11 26.7 | +0.6304 | 0.5172 | 0.2273 | +77 | - 8 |
| 2 Libræ | 6.5 | 1.46 | 5.4 | 11 12.9 | 13 2.5 | - 6 16.7 | +0.9750 | 0.5192 | 0.2237 | +79 | +13 |
| μ Libræ | 5.7 | -1.66 | + 5.2 | -13 41.5 | 5 1 49.2 | + 6 6.2 | +0.8024 | 0.5294 | -0.2138 | +76 | + 2 |
| ν Libræ | 5.5 | 1.77 | 5.5 | 15 49.9 | 10 5.5 | - 9 53.4 | +1.3190 | 0.5366 | 0.2055 | +74 | +48 |
| σ Libræ | 6.4 | 1.83 | 4.4 | 15 9.2 | 16 50.6 | - 3 21.5 | -0.7554 | 0.5420 | 0.1973 | - 6 | -90 |
| ζ Libræ | 6.0 | 1.87 | 4.5 | 16 20.1 | 20 9.6 | - 0 9.2 | -0.1655 | 0.5457 | 0.1932 | +25 | -51 |
| η Libræ | 7.0 | 1.89 | 4.6 | 17 3.8 | 20 45.5 | + 0 25.5 | +0.4808 | 0.5464 | 0.1926 | +61 | -15 |
| ζ^2 Libræ | 6.0 | -1.88 | + 4.4 | -16 13.9 | 21 16.1 | + 0 55.1 | -0.4877 | 0.5468 | -0.1919 | + 8 | -72 |
| ζ^1 Libræ | 5.8 | 1.89 | 4.3 | 16 28.9 | 22 17.5 | + 1 54.3 | -0.4216 | 0.5479 | 0.1905 | +12 | -67 |
| 47 Libræ | 6.4 | 2.02 | 4.1 | 19 3.6 | 6 8 7.9 | +11 24.5 | +0.4602 | 0.5575 | 0.1756 | +57 | -16 |
| β Scorpii | 2.9 | 2.07 | 3.7 | 19 30.4 | 12 40.8 | - 8 12.3 | +0.1396 | 0.5613 | 0.1681 | +38 | -33 |
| β^2 Scorpii | 5.5 | 2.07 | 3.7 | 19 30.2 | 12 40.9 | - 8 12.2 | +0.1362 | 0.5613 | 0.1681 | +38 | -34 |
| ω^1 Scorpii | 4.6 | -2.09 | + 3.9 | -20 22.4 | 13 15.5 | - 7 38.8 | +0.9380 | 0.5622 | -0.1671 | +70 | +13 |
| ω^2 Scorpii | 4.6 | 2.10 | 3.9 | 20 34.4 | 13 30.6 | - 7 24.2 | +1.1050 | 0.5623 | 0.1666 | +69 | +26 |
| ν^2 Scorpii | 4.2 | 2.09 | 3.3 | 19 10.7 | 15 30.9 | - 5 28.3 | -0.6677 | 0.5645 | 0.1628 | - 6 | -90 |
| ψ Ophiuchi | 4.8 | 2.04 | 2.8 | 19 46.9 | 20 39.5 | - 0 30.9 | -0.8559 | 0.5693 | 0.1535 | -17 | -90 |
| ω Ophiuchi | 4.7 | 2.19 | 2.8 | 21 13.9 | 7 0 0.0 | + 2 42.2 | +0.1336 | 0.5733 | 0.1466 | +35 | -34 |
| 22 Ophiuchi | 6.7 | -2.31 | + 1.9 | -23 19.9 | 9 18.0 | +11 39.0 | +1.0120 | 0.5817 | -0.1263 | +67 | +20 |
| 24 Ophiuchi | 6.0 | 2.31 | 1.7 | 22 58.6 | 10 5.7 | -11 35.0 | +0.5475 | 0.5831 | 0.1243 | +57 | -11 |
| 39 Ophiuchi <i>mult.</i> | 5.5 | 2.38 | 0.7 | 24 10.1 | 18 32.5 | - 3 28.0 | +0.7905 | 0.5889 | 0.1039 | +66 | + 4 |
| B. A. C. 5831 | 6.5 | 2.38 | 0.7 | 23 57.1 | 18 34.8 | - 3 25.8 | +0.5654 | 0.5885 | 0.1038 | +57 | - 9 |
| δ Ophiuchi <i>var.</i> | 4.4 | 2.39 | + 0.1 | 24 4.5 | 21 49.3 | - 0 18.9 | +0.3676 | 0.5921 | 0.0955 | +44 | -21 |
| ϵ Ophiuchi | 5.2 | -2.40 | - 0.1 | -23 52.7 | 23 47.5 | + 1 34.5 | -0.0151 | 0.5942 | -0.0904 | +22 | -42 |
| λ Sagittarii | 2.9 | 2.52 | - 2.7 | 25 28.8 | 8 21 14.3 | - 1 51.6 | +0.4300 | 0.6082 | -0.0290 | +41 | -17 |
| NEW MOON. | | | | | | | | | | | |
| χ Capricorni | 5.4 | 2.23 | -11.7 | 21 38.1 | 11 8 56.4 | + 7 19.2 | +0.1806 | 0.5985 | +0.1471 | +37 | -31 |
| 27 Capricorni | 6.5 | -2.22 | -11.7 | -20 59.8 | 9 19.4 | + 7 41.3 | -0.3907 | 0.5985 | +0.1479 | + 8 | -66 |
| ϕ Capricorni | 5.5 | 2.20 | 11.9 | 21 6.5 | 11 40.2 | + 9 56.4 | +0.0722 | 0.5971 | 0.1537 | +32 | -37 |
| 33 Capricorni | 5.7 | 2.16 | 12.3 | 21 19.1 | 14 58.5 | -10 53.4 | +0.7996 | 0.5943 | 0.1616 | +69 | + 4 |
| 37 Capricorni | 6.0 | 2.10 | 12.4 | 20 34.4 | 19 10.1 | - 6 51.8 | +0.7634 | 0.5910 | 0.1711 | +69 | + 2 |
| ϵ Capricorni | 4.7 | 2.08 | 12.5 | 19 57.5 | 20 2.9 | - 6 1.1 | +0.3091 | 0.5912 | 0.1734 | +47 | -24 |
| κ Capricorni | 5.0 | -2.05 | -12.5 | -19 21.9 | 22 15.0 | - 3 54.3 | +0.1118 | 0.5898 | +0.1779 | +36 | -35 |
| B. A. C. 7550 | 6.3 | 2.04 | 12.6 | 20 7.3 | 22 28.3 | - 3 41.5 | +0.8978 | 0.5895 | 0.1784 | +70 | +10 |
| 29 Aquarii <i>mult.</i> | 6.5 | 1.94 | 12.6 | 17 29.5 | 12 6 11.0 | + 3 43.1 | -0.2614 | 0.5830 | 0.1937 | +19 | -56 |
| 56 Aquarii | 6.3 | 1.81 | 12.7 | 15 8.7 | 17 37.6 | - 9 16.3 | -0.2487 | 0.5740 | 0.2128 | +22 | -56 |
| τ Aquarii <i>mult.</i> | 5.8 | 1.73 | 12.8 | 14 38.0 | 13 0 57.3 | - 2 12.9 | +0.4461 | 0.5688 | 0.2238 | +75 | + 5 |
| τ^2 Aquarii | 4.1 | -1.72 | -12.7 | -14 10.3 | 1 45.6 | - 1 26.4 | +0.5702 | 0.5681 | +0.2248 | +70 | -11 |
| 74 Aquarii | 6.0 | 1.70 | 12.3 | 12 12.0 | 3 25.5 | + 0 9.9 | -1.0120 | 0.5672 | 0.2272 | -20 | -90 |
| ψ^2 Aquarii | 4.2 | 1.57 | 11.9 | 9 46.9 | 14 0.1 | +10 21.7 | -0.9550 | 0.5594 | 0.2389 | -14 | -90 |
| ψ^1 Aquarii | 4.8 | 1.57 | 12.0 | 10 12.6 | 14 27.7 | +10 48.3 | -0.4169 | 0.5590 | 0.2390 | +16 | -66 |
| B. A. C. 8274 | 7.0 | 1.41 | 10.8 | 6 59.4 | 14 3 38.6 | - 0 28.2 | -0.4174 | 0.5507 | 0.2486 | +18 | -66 |
| 30 Piscium | 4.6 | -1.34 | -10.9 | - 6 37.4 | 9 44.3 | + 5 25.0 | +0.7403 | 0.5476 | +0.2518 | +82 | - 2 |
| 33 Piscium | 4.7 | -1.32 | -10.8 | - 6 19.2 | 11 17.3 | + 6 54.8 | +0.8273 | 0.5466 | +0.2522 | +84 | + 3 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | | | Limiting Parallels. | |
|--------------------------------|------|------------------------|----------------|-------------------------|--------------------------|-----------------|---------|--------|---------|-----|-----|------------------------|--|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. | | |
| | | $\Delta\alpha$ | $\Delta\delta$ | | | | | | | | | | |
| B. A. C. 17 | 6.0 | -1.30 | -10.7 | - 5 51.4 | d h m | h m | +0.9395 | 0.5458 | +0.2532 | +84 | +10 | | |
| 14 Ceti | 6.0 | 1.18 | 8.9 | 1 6.5 | 14 13 34.3 | + 9 7.1 | -0.8770 | 0.5400 | 0.2551 | - 7 | -90 | | |
| 15 Ceti | 6.8 | 1.17 | 8.9 | - 1 6.5 | 15 1 16.5 | - 3 33.9 | -0.5727 | 0.5400 | 0.2553 | +11 | -78 | | |
| 26 Ceti | 5.9 | 1.03 | 8.0 | + 0 46.9 | 2 28.2 | - 2 24.5 | +0.5993 | 0.5358 | 0.2535 | +80 | -10 | | |
| 29 Ceti | 6.3 | 1.01 | 7.7 | 1 25.3 | 14 36.6 | + 9 20.2 | +0.4506 | 0.5356 | 0.2530 | +68 | -18 | | |
| 33 Ceti | 6.1 | -1.00 | - 7.4 | + 1 51.9 | 16 35.4 | +11 15.1 | +0.3061 | 0.5351 | +0.2525 | +59 | -25 | | |
| 35 Ceti | 6.3 | 0.99 | 7.4 | 1 53.6 | 17 48.9 | -11 33.7 | +0.5152 | 0.5346 | 0.2522 | +73 | -14 | | |
| f Piscium | 5.1 | 0.97 | 6.9 | 3 2.3 | 18 45.3 | -10 39.1 | -0.0222 | 0.5346 | 0.2515 | +40 | -42 | | |
| μ Piscium | 5.0 | 0.92 | 5.8 | 5 34.7 | 21 15.7 | - 8 13.6 | -1.1550 | 0.5341 | 0.2488 | -25 | -84 | | |
| ν Piscium | 4.6 | 0.83 | 5.7 | 4 56.1 | 16 3 8.6 | - 2 32.0 | +0.8457 | 0.5337 | 0.2458 | +90 | + 5 | | |
| 64 Ceti | 5.7 | -0.70 | - 4.0 | + 8 3.5 | 8 33.2 | + 2 42.2 | +1.0730 | 0.5333 | +0.2349 | +90 | +21 | | |
| ξ^1 Ceti | 4.5 | 0.69 | 3.9 | 8 20.0 | 22 52.8 | - 7 25.7 | +0.9707 | 0.5331 | 0.2340 | +90 | +14 | | |
| ξ Arietis | 5.3 | 0.64 | 3.0 | 10 7.0 | 23 39.4 | - 6 40.5 | +0.4246 | 0.5340 | 0.2292 | +67 | -16 | | |
| B. A. C. 755 | 6.5 | 0.63 | 3.0 | 10 4.4 | 17 5 17.2 | - 1 13.6 | +0.6828 | 0.5340 | 0.2280 | +89 | - 3 | | |
| 31 Arietis | 5.7 | 0.58 | 2.1 | 11 58.5 | 6 13.0 | - 0 19.6 | -0.2453 | 0.5350 | 0.2232 | +28 | -51 | | |
| 38 Arietis | 5.0 | -0.53 | - 1.9 | +11 59.2 | 10 53.3 | + 4 11.7 | +0.6219 | 0.5354 | +0.2185 | +83 | - 5 | | |
| B. A. C. 1240 | 6.0 | 0.17 | + 1.0 | 17 53.1 | 14 51.7 | + 8 2.5 | +1.2955 | 0.5444 | 0.1663 | +90 | +54 | | |
| B. A. C. 1242 | 6.3 | 0.18 | 1.6 | 19 53.6 | 2 23.1 | - 5 36.1 | -0.8177 | 0.5446 | 0.1659 | - 5 | -70 | | |
| ω^1 Tauri | 6.0 | 0.14 | 1.5 | 19 19.2 | 6 5.1 | - 2 1.5 | +0.3937 | 0.5459 | 0.1596 | +66 | -10 | | |
| NEPTUNE | | | | 19 22.6 | 9 22.4 | + 1 9.1 | +0.8471 | 0.5471 | 0.1535 | +90 | +16 | | |
| ω^2 Tauri | 5.7 | -0.10 | + 1.9 | +20 18.6 | 9 46.5 | + 1 32.4 | -0.0853 | 0.5469 | +0.1528 | +36 | -34 | | |
| 51 Tauri | 6.0 | 0.09 | 2.2 | 21 18.8 | 10 15.6 | + 2 0.6 | -1.0800 | 0.5469 | 0.1521 | -24 | -69 | | |
| 53 Tauri | 6.0 | 0.09 | 2.1 | 20 52.7 | 10 45.0 | + 2 29.0 | -0.5445 | 0.5476 | 0.1513 | +11 | -60 | | |
| 56 Tauri | 6.0 | 0.09 | 2.2 | 21 30.6 | 10 49.1 | + 2 32.9 | -1.2080 | 0.5479 | 0.1511 | -37 | -68 | | |
| κ^2 Tauri | 6.3 | 0.06 | 2.4 | 21 57.0 | 13 26.9 | + 5 5.4 | -1.2860 | 0.5482 | 0.1453 | -51 | -68 | | |
| B. A. C. 1373 | 6.0 | -0.05 | + 2.2 | +21 22.4 | 14 38.4 | + 6 14.5 | -0.4991 | 0.5491 | +0.1435 | +14 | -57 | | |
| W. iv, 650 | 6.0 | +0.01 | 2.1 | 20 27.9 | 19 18.4 | +10 45.0 | +1.1190 | 0.5495 | 0.1346 | +90 | +38 | | |
| τ Tauri | 4.5 | 0.03 | 2.7 | 22 44.9 | 21 3.3 | -11 33.8 | -1.0930 | 0.5511 | 0.1311 | -26 | -67 | | |
| 103 Tauri | 6.0 | 0.14 | 3.0 | 24 7.2 | 20 8 37.9 | - 0 23.0 | -1.1920 | 0.5536 | 0.1067 | -37 | -66 | | |
| 121 Tauri | 6.0 | 0.26 | 2.9 | 23 57.9 | 20 47.6 | +11 21.4 | +0.1101 | 0.5564 | 0.0797 | +48 | -15 | | |
| 132 Tauri | 5.3 | +0.32 | + 3.1 | +24 31.8 | 21 2 47.2 | - 6 51.6 | -0.0650 | 0.5572 | +0.0664 | +37 | -24 | | |
| 5 Geminorum | 6.7 | 0.40 | 2.8 | 24 26.7 | 12 44.1 | + 2 44.4 | +0.5742 | 0.5582 | 0.0430 | +83 | +12 | | |
| 8 Geminorum | 6.5 | 0.42 | 2.8 | 24 0.3 | 14 51.3 | + 4 47.1 | +1.1390 | 0.5578 | 0.0380 | +90 | +49 | | |
| ϵ Geminorum | 2.2 | 0.51 | 2.4 | 25 14.3 | 22 3 1.5 | - 7 28.2 | +0.0873 | 0.5576 | +0.0094 | +46 | -11 | | |
| 37 Geminorum | 6.3 | 0.54 | 2.2 | 25 30.7 | 8 3.7 | - 2 36.5 | -0.1949 | 0.5572 | -0.0027 | +30 | -25 | | |
| 39 Geminorum | 6.3 | +0.55 | + 2.3 | +26 13.4 | 9 35.7 | - 1 7.8 | -0.9781 | 0.5569 | -0.0060 | -19 | -64 | | |
| 40 Geminorum | 6.3 | 0.56 | 2.3 | 26 3.8 | 9 53.4 | - 0 50.7 | -0.8052 | 0.5569 | 0.0067 | - 6 | -64 | | |
| ω Geminorum | 5.7 | 0.56 | 2.0 | 24 22.2 | 11 14.3 | + 0 27.4 | +1.0350 | 0.5575 | 0.0101 | +90 | +43 | | |
| 48 Geminorum | 6.0 | 0.58 | 1.8 | 24 18.7 | 15 42.0 | + 4 45.8 | +1.0310 | 0.5559 | 0.0205 | +90 | +42 | | |
| 52 Geminorum | 6.3 | 0.59 | 1.9 | 25 4.4 | 16 41.4 | + 5 43.2 | +0.1752 | 0.5554 | 0.0226 | +52 | - 8 | | |
| A Geminorum | 5.7 | +0.61 | + 1.7 | +25 15.5 | 20 37.0 | + 9 30.6 | -0.1335 | 0.5536 | -0.0318 | +34 | -25 | | |
| κ Geminor. <i>mult.</i> | 3.6 | 0.62 | 1.2 | 24 39.6 | 23 6 4.2 | - 5 21.7 | +0.1209 | 0.5521 | 0.0533 | +49 | -13 | | |
| ω^2 Cancri | 6.3 | 0.67 | + 0.9 | 25 23.4 | 13 55.2 | + 2 13.3 | -1.1670 | 0.5494 | 0.0704 | -36 | -65 | | |
| λ Cancri | 5.7 | 0.68 | 0.0 | 24 21.9 | 22 36.1 | +10 36.7 | -0.7316 | 0.5460 | 0.0884 | - 1 | -66 | | |
| γ Cancri | 4.9 | 0.67 | - 0.2 | 21 51.7 | 24 9 18.2 | - 3 2.4 | +0.9670 | 0.5410 | 0.1100 | +90 | +28 | | |
| η Leonis | 3.3 | +0.56 | - 2.0 | +17 17.6 | 26 2 40.8 | -10 57.4 | +0.0037 | 0.5193 | -0.1771 | +41 | -33 | | |
| 42 Leonis | 6.0 | 0.52 | 2.1 | 15 31.5 | 10 11.0 | - 3 40.5 | +0.6038 | 0.5153 | 0.1865 | +82 | - 3 | | |
| δ Leonis | 5.7 | 0.49 | 2.3 | 14 41.8 | 15 35.7 | + 1 34.6 | +0.4982 | 0.5125 | 0.1924 | +73 | -10 | | |
| k Leonis | 5.7 | 0.45 | 2.6 | 14 46.2 | 23 6.5 | + 8 52.5 | -1.0620 | 0.5091 | 0.2004 | -20 | -75 | | |
| ι Leonis <i>mult.</i> | 4.1 | 0.32 | 2.7 | 11 7.8 | 27 19 19.4 | + 4 31.1 | -1.2520 | 0.5021 | 0.2176 | -35 | -79 | | |
| ω Virginis | 5.9 | +0.27 | - 2.5 | + 8 44.3 | 28 3 18.8 | -11 42.8 | -0.3550 | 0.4992 | -0.2226 | +22 | -59 | | |
| ξ Virginis | 5.3 | 0.24 | 2.6 | 8 51.8 | 7 4.3 | - 8 3.6 | -1.3350 | 0.4987 | 0.2249 | -45 | -81 | | |
| ν Virginis | 4.0 | 0.23 | 2.2 | 7 8.4 | 7 23.8 | - 7 44.7 | +0.5028 | 0.4982 | 0.2252 | +72 | -13 | | |
| c Virginis | 5.5 | +0.08 | 2.0 | 3 55.2 | 29 2 33.7 | +10 53.9 | -0.3260 | 0.4957 | 0.2328 | +24 | -59 | | |
| B. A. C. 4254 | 6.1 | -0.01 | 2.0 | + 2 27.3 | 12 34.7 | - 3 21.4 | -1.0480 | 0.4957 | 0.2350 | -17 | -88 | | |
| 65 Virginis | 6.1 | -0.25 | - 0.9 | - 4 21.3 | 30 13 21.6 | - 3 15.3 | +0.6040 | 0.4996 | -0.2345 | +79 | -10 | | |
| 66 Virginis | 6.0 | -0.25 | - 0.8 | - 4 35.6 | 14 1.3 | - 2 36.7 | +0.7099 | 0.5000 | -0.2345 | +85 | - 4 | | |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

| THE STAR'S | | | | AT CONJUNCTION IN R. A. | | | | | Limiting Parallels. | |
|-------------------------|------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|------------------------|---------|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. S. |
| | | $\Delta\alpha$ | $\Delta\delta$ | | d h m | h m | | | | |
| ι^3 Virginis | 5.1 | -0.30 | -0.6 | -5 41.6 | 30 18 3.9 | +1 19.1 | +0.9654 | 0.5013 | -0.2335 | +84 +12 |
| 80 Virginis | 6.1 | 0.31 | 0.9 | 4 50.4 | 19 59.6 | +3 11.5 | -0.4172 | 0.5023 | 0.2330 | +19 -66 |
| 88 Virginis | 6.8 | 0.38 | 0.7 | 6 17.6 | 31 2 51.9 | +9 52.3 | -0.4229 | 0.5043 | 0.2307 | +18 -67 |
| R.A.C.4647 <i>mult.</i> | 6.4 | 0.42 | 0.4 | 7 31.3 | 6 25.3 | -10 40.4 | +0.0960 | 0.5058 | 0.2290 | +45 -36 |
| 94 Virginis | 6.8 | 0.48 | 0.4 | 8 22.3 | 12 23.9 | -4 52.1 | -0.3418 | 0.5092 | 0.2262 | +22 -61 |
| 95 Virginis | 6.0 | -0.49 | -0.2 | -8 47.6 | 12 37.4 | -4 38.9 | +0.0633 | 0.5092 | -0.2262 | +43 -38 |
| 96 Virginis | 6.9 | 0.50 | +0.1 | 9 49.1 | 13 48.5 | -3 29.9 | +0.9078 | 0.5092 | 0.2252 | +80 +8 |
| κ Virginis | 4.2 | 0.52 | -0.1 | 9 46.0 | 15 50.5 | -1 31.5 | +0.3953 | 0.5105 | 0.2244 | +61 -20 |
| 2 Libræ | 6.5 | -0.58 | +0.2 | -11 13.0 | 21 17.4 | +3 45.8 | +0.7462 | 0.5132 | -0.2208 | +77 -1 |

FEBRUARY.

| | | | | | | | | | | |
|------------------------------------|-----|-------|-------|----------|-----------|----------|---------|--------|---------|---------|
| μ Libræ | 5.7 | -0.73 | +0.5 | -13 41.6 | 1 10 23.6 | -7 31.6 | +0.5769 | 0.5218 | -0.2102 | +70 -10 |
| ν^1 Libræ | 5.5 | 0.83 | 0.8 | 15 50.0 | 18 53.4 | +0 42.4 | +1.1080 | 0.5282 | 0.2018 | +74 +24 |
| σ^1 Libræ | 6.4 | 0.90 | 0.2 | 15 9.3 | 2 1 49.9 | +7 25.7 | -0.9858 | 0.5341 | 0.1938 | -20 -90 |
| ζ^1 Libræ | 6.0 | -0.94 | +0.4 | -16 20.2 | 5 14.5 | +10 43.7 | -0.3851 | 0.5369 | -0.1898 | +14 -65 |
| ζ^2 Libræ | 7.0 | 0.96 | 0.6 | 17 3.8 | 5 51.3 | +11 19.3 | +0.2680 | 0.5369 | 0.1896 | +48 -27 |
| ζ^3 Libræ | 6.0 | 0.96 | 0.4 | 16 14.0 | 6 22.8 | +11 49.3 | -0.7107 | 0.5374 | 0.1876 | -5 -90 |
| ζ^4 Libræ | 5.8 | 0.97 | 0.3 | 16 29.0 | 7 25.9 | -11 9.3 | -0.6420 | 0.5367 | 0.1864 | 0 -87 |
| λ Libræ | 5.1 | 1.11 | 0.8 | 19 50.4 | 16 47.1 | -2 6.7 | +1.2120 | 0.5468 | 0.1729 | +70 +36 |
| 47 Libræ | 6.4 | -1.12 | +0.6 | -19 3.6 | 17 33.4 | -1 22.0 | +0.2592 | 0.5480 | -0.1716 | +45 -28 |
| β^1 Scorpii | 2.9 | 1.16 | 0.3 | 19 30.4 | 22 14.3 | +3 9.2 | -0.0593 | 0.5517 | 0.1651 | +27 -45 |
| β^2 Scorpii | 5.5 | 1.16 | 0.3 | 19 30.2 | 22 14.4 | +3 9.3 | -0.0628 | 0.5517 | 0.1651 | +27 -46 |
| ω^1 Scorpii | 4.6 | 1.19 | 0.6 | 20 22.4 | 22 50.0 | +3 43.7 | +0.7519 | 0.5526 | 0.1631 | +68 +1 |
| ω^2 Scorpii | 4.6 | 1.19 | +0.6 | 20 34.4 | 23 5.5 | +3 58.7 | +0.9196 | 0.5529 | 0.1623 | +69 +11 |
| ν^2 Scorpii | 4.2 | -1.20 | 0.0 | -19 10.7 | 3 1 9.3 | +5 58.1 | -0.8728 | 0.5545 | -0.1594 | -17 -90 |
| ψ Ophiuchi | 4.8 | 1.26 | -0.2 | 19 46.9 | 6 26.8 | +11 4.5 | -1.0570 | 0.5600 | 0.1489 | -31 -90 |
| ω Ophiuchi | 4.7 | 1.31 | 0.0 | 21 13.9 | 9 53.0 | -9 36.8 | -0.0502 | 0.5633 | 0.1430 | +25 -44 |
| 22 Ophiuchi | 6.7 | 1.44 | -0.2 | 23 19.9 | 19 26.2 | -0 24.6 | +0.8535 | 0.5728 | 0.1226 | +67 +8 |
| 24 Ophiuchi | 6.0 | 1.45 | +0.2 | 22 58.6 | 20 15.3 | +0 22.8 | +0.3872 | 0.5737 | 0.1213 | +47 -20 |
| 39 Ophiuchi <i>mult.</i> | 5.5 | -1.56 | -0.8 | -24 10.1 | 4 4 55.0 | +8 42.7 | +0.6443 | 0.5813 | -0.1010 | +62 -5 |
| B. A. C. 5831 | 6.5 | 1.55 | 0.9 | 23 57.1 | 4 57.5 | +8 45.2 | +0.4170 | 0.5813 | 0.1010 | +46 -18 |
| θ Ophiuchi | 3.3 | 1.58 | 0.8 | 24 53.5 | 6 30.7 | +10 14.8 | +1.2260 | 0.5822 | 0.0963 | +65 +43 |
| b Ophiuchi <i>var.</i> | 4.4 | 1.58 | 1.2 | 24 4.5 | 8 16.6 | +11 56.5 | +0.2218 | 0.5841 | 0.0927 | +34 -29 |
| c^2 Ophiuchi | 5.2 | 1.61 | 1.4 | 23 52.7 | 10 17.7 | -10 7.1 | -0.1601 | 0.5858 | 0.0876 | +14 -51 |
| 63 Ophiuchi | 6.6 | -1.72 | -1.8 | -24 51.9 | 19 30.7 | -1 16.0 | +0.1472 | 0.5928 | -0.0646 | +28 -33 |
| 4 Sagittarii | 5.4 | 1.72 | 2.4 | 23 43.3 | 21 25.7 | +0 34.4 | -1.0440 | 0.5950 | 0.0577 | -40 -90 |
| 7 Sagittarii | 5.9 | 1.74 | 2.4 | 24 16.8 | 22 36.0 | +1 41.8 | -0.6206 | 0.5952 | 0.0549 | -14 -88 |
| 9 Sagittarii | 6.0 | 1.74 | 2.4 | 24 21.8 | 22 59.6 | +2 4.4 | -0.5641 | 0.5957 | 0.0535 | -11 -81 |
| λ Sagittarii | 2.9 | 1.84 | 3.1 | 25 28.8 | 5 8 10.8 | +10 53.0 | +0.1951 | 0.6022 | 0.0272 | +27 -30 |
| B. A. C. 6369 | 6.2 | -1.87 | -4.2 | -25 7.2 | 14 32.2 | -7 1.3 | -0.2789 | 0.6047 | -0.0080 | 0 -59 |
| σ Sagittarii | 2.3 | 1.92 | 4.4 | 26 26.0 | 18 24.8 | -3 18.5 | +1.0270 | 0.6057 | +0.0037 | +64 +23 |
| ψ Sagittarii | 5.4 | 1.95 | 5.5 | 25 26.0 | 6 1 58.1 | +3 55.7 | +0.1528 | 0.6087 | 0.0269 | +25 -32 |
| χ^1 Sagittarii | 5.4 | 1.96 | 6.1 | 24 43.3 | 5 35.1 | +7 23.6 | -0.4503 | 0.6085 | 0.0365 | -7 -71 |
| χ^2 Sagittarii | 6.3 | 1.96 | 6.1 | 24 37.6 | 5 37.5 | +7 25.8 | -0.5430 | 0.6085 | 0.0365 | -11 -79 |
| χ^3 Sagittarii | 5.6 | -1.95 | -6.2 | -24 10.7 | 5 40.7 | +7 28.9 | -0.9868 | 0.6085 | +0.0384 | -37 -90 |
| λ^1 Sagittarii <i>rar.</i> | 6.0 | 1.98 | 6.4 | 24 57.6 | 9 33.4 | +11 11.7 | -0.0364 | 0.6094 | 0.0502 | +17 -43 |
| λ^2 Sagittarii | 4.6 | 1.98 | 6.5 | 25 7.5 | 9 48.1 | +11 25.8 | +0.1388 | 0.6094 | 0.0506 | +25 -34 |
| NEW MOON. | | | | | | | | | | |
| τ^1 Aquarii <i>mult.</i> | 5.8 | -1.76 | -12.5 | -14 38.0 | 9 11 17.4 | +9 55.3 | +0.9543 | 0.5780 | +0.2294 | +75 +12 |
| τ^2 Aquarii | 4.1 | 1.76 | 12.4 | 14 10.3 | 12 4.3 | +10 40.5 | +0.6818 | 0.5769 | 0.2805 | +76 -5 |
| 74 Aquarii | 6.0 | 1.75 | 12.3 | 12 12.0 | 13 41.4 | -11 46.1 | -0.8728 | 0.5761 | 0.2326 | -10 -90 |
| ψ^1 Aquarii | 4.1 | 1.69 | 12.1 | 9 41.0 | 23 4.7 | -2 43.7 | -1.1020 | 0.5693 | 0.2439 | -34 -90 |
| ψ^2 Aquarii | 4.2 | 1.68 | 12.1 | 9 46.9 | 23 57.0 | -1 53.3 | -0.7909 | 0.5688 | 0.2446 | -4 -90 |
| ψ^3 Aquarii | 4.8 | -1.68 | -12.2 | -10 12.6 | 10 0 23.8 | -1 27.5 | -0.2614 | 0.5682 | +0.2451 | +25 -56 |
| B. A. C. 8274 | 7.0 | -1.58 | -11.6 | -6 59.4 | 13 8.5 | +10 49.7 | -0.2348 | 0.5610 | +0.2558 | +27 -54 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | Limiting Parallels. | |
|--------------------------------|------|---------------------|----------------|-----------------------|-------------------------|---------------------|----------|-----------|-----------|---------------------|-----|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle <i>H</i> | <i>Y</i> | <i>z'</i> | <i>y'</i> | N. | S. |
| | | $\Delta\alpha$ | $\Delta\delta$ | | d h m | h m | | | | | |
| 30 Piscium | 4.6 | -1.53 | -11.5 | - 6 37.4 | 10 19 1.5 | - 7 29.8 | +0.9143 | 0.5575 | +0.2582 | +83 | + 8 |
| 33 Piscium | 4.7 | 1.52 | 11.4 | 6 19.2 | 20 31.2 | - 6 3.3 | +1.0030 | 0.5573 | 0.2590 | +84 | +14 |
| B. A. C. 17 | 6.0 | 1.50 | 11.3 | 5 51.4 | 22 43.4 | - 3 55.6 | +1.1170 | 0.5559 | 0.2595 | +84 | +22 |
| 14 Ceti | 6.0 | 1.42 | 10.0 | 1 6.5 | 11 10 0.3 | + 6 57.8 | -0.6457 | 0.5502 | 0.2614 | + 7 | -84 |
| 15 Ceti | 6.8 | 1.43 | 9.9 | - 1 6.5 | 11 9.3 | + 8 4.5 | -0.3449 | 0.5502 | 0.2617 | +23 | -61 |
| 26 Ceti | 5.9 | -1.32 | - 9.0 | + 0 46.9 | 22 51.3 | - 4 37.3 | +0.8230 | 0.5465 | +0.2598 | +90 | + 3 |
| 29 Ceti | 6.3 | 1.31 | 8.8 | 1 25.3 | 12 0 45.8 | - 2 46.7 | +0.6778 | 0.5454 | 0.2589 | +88 | - 5 |
| 33 Ceti | 6.1 | 1.30 | 8.5 | 1 51.9 | 1 56.8 | - 1 38.2 | +0.5375 | 0.5450 | 0.2587 | +75 | -13 |
| 35 Ceti | 6.3 | 1.29 | 8.5 | 1 53.6 | 2 51.2 | - 0 45.4 | +0.7457 | 0.5450 | 0.2581 | +90 | - 2 |
| <i>f</i> Piscium | 5.1 | 1.28 | 8.2 | 3 2.3 | 5 16.3 | + 1 34.8 | +0.2178 | 0.5446 | 0.2571 | +54 | -20 |
| μ Piscium | 5.0 | -1.24 | - 7.1 | + 5 34.7 | 10 56.8 | + 7 3.9 | -0.8890 | 0.5438 | +0.2542 | - 7 | -84 |
| ν Piscium | 4.6 | 1.16 | 7.0 | 4 56.1 | 16 10.3 | -11 53.0 | +1.0825 | 0.5429 | 0.2508 | +90 | +20 |
| 64 Ceti | 5.7 | 1.06 | 5.3 | 8 3.5 | 13 6 2.0 | + 1 31.2 | +1.3170 | 0.5413 | 0.2388 | +90 | +45 |
| ξ^1 Ceti | 4.5 | 1.05 | 5.2 | 8 20.0 | 6 47.2 | + 2 14.9 | +1.2160 | 0.5413 | 0.2380 | +90 | +33 |
| ξ Arietis | 5.3 | 1.01 | 4.4 | 10 6.9 | 12 15.2 | + 7 32.0 | +0.6842 | 0.5413 | 0.2324 | +90 | - 3 |
| B. A. C. 755 | 6.5 | -1.00 | - 4.4 | +10 4.3 | 13 9.3 | + 8 24.3 | +0.9385 | 0.5413 | +0.2314 | +90 | +13 |
| 31 Arietis | 5.7 | 0.96 | 3.5 | 11 58.5 | 17 41.5 | -11 12.6 | +0.0223 | 0.5413 | 0.2263 | +43 | -36 |
| 38 Arietis | 5.0 | 0.92 | 3.3 | 11 59.2 | 21 33.6 | - 7 28.1 | +0.8780 | 0.5420 | 0.2260 | +90 | +10 |
| σ Arietis | 5.5 | 0.90 | - 2.2 | 14 37.9 | 14 0 33.0 | - 4 34.7 | -1.1980 | 0.5424 | 0.2173 | -31 | -75 |
| B. A. C. 1242 | 6.3 | 0.55 | + 1.2 | 19 53.6 | 15 8 21.0 | + 2 9.2 | -0.5606 | 0.5474 | 0.1661 | +11 | -63 |
| ω^1 Tauri | 6.0 | -0.50 | + 1.1 | +19 19.2 | 12 0.1 | + 5 40.9 | +0.6409 | 0.5483 | +0.1597 | +88 | + 4 |
| NEPTUNE | | | | 19 22.4 | 14 56.2 | + 8 31.0 | +1.0460 | 0.5490 | 0.1540 | +90 | +29 |
| ω^2 Tauri | 5.7 | 0.47 | 1.6 | 20 18.6 | 15 38.6 | + 9 11.9 | +0.1640 | 0.5487 | 0.1526 | +51 | -21 |
| 51 Tauri | 6.0 | 0.46 | 2.0 | 21 18.8 | 16 7.4 | + 9 39.8 | -0.8235 | 0.5489 | 0.1514 | - 5 | -69 |
| 53 Tauri | 6.0 | 0.45 | 1.8 | 20 52.7 | 16 36.4 | +10 7.8 | -0.2933 | 0.5498 | 0.1507 | +25 | -45 |
| 56 Tauri | 6.0 | -0.45 | + 2.0 | +21 30.6 | 16 40.4 | +10 11.6 | -0.9521 | 0.5498 | +0.1507 | -14 | -68 |
| κ^1 Tauri | 4.7 | 0.42 | 2.3 | 22 2.6 | 19 15.4 | -11 18.7 | -1.1340 | 0.5498 | 0.1454 | -29 | -68 |
| κ^2 Tauri | 6.3 | 0.42 | 2.3 | 21 57.0 | 19 16.5 | -11 17.6 | -1.0340 | 0.5498 | 0.1454 | -20 | -68 |
| B. A. C. 1373 | 6.0 | 0.40 | 2.1 | 21 22.4 | 20 27.2 | -10 9.3 | -0.2531 | 0.5504 | 0.1432 | +27 | -41 |
| τ Tauri | 4.5 | 0.33 | 2.9 | 22 44.9 | 16 2 48.5 | - 4 1.1 | -0.8492 | 0.5517 | 0.1300 | - 7 | -67 |
| 99 Tauri | 6.0 | -0.24 | + 3.5 | +23 46.6 | 9 44.1 | + 2 40.1 | -1.0980 | 0.5530 | +0.1155 | -27 | -66 |
| 103 Tauri | 6.0 | 0.18 | 3.5 | 24 7.2 | 14 18.6 | + 7 5.0 | -0.9642 | 0.5534 | 0.1055 | -16 | -66 |
| 118 Tauri | 5.7 | 0.05 | 4.0 | 25 3.7 | 23 40.7 | - 7 52.4 | -1.0860 | 0.5549 | 0.0847 | -27 | -65 |
| 121 Tauri | 6.0 | -0.02 | 3.6 | 23 57.9 | 17 2 26.2 | - 5 12.7 | +0.3183 | 0.5550 | 0.0783 | +61 | - 6 |
| 132 Tauri | 5.3 | +0.07 | 4.1 | 24 31.8 | 8 25.5 | + 0 34.1 | +0.1370 | 0.5550 | 0.0645 | +50 | -13 |
| 139 Tauri | 5.3 | +0.12 | + 4.4 | +25 56.4 | 12 21.8 | + 4 22.2 | -1.1530 | 0.5552 | +0.0555 | -35 | -64 |
| 5 Geminorum | 6.7 | 0.19 | 3.9 | 24 26.7 | 18 23.0 | +10 10.6 | +0.7595 | 0.5552 | 0.0414 | +90 | +23 |
| ϵ Geminorum | 3.2 | 0.36 | 3.6 | 25 14.3 | 18 43.4 | + 0 1.1 | +0.2491 | 0.5544 | +0.0076 | +57 | - 2 |
| 37 Geminorum | 6.3 | 0.42 | 3.5 | 25 30.7 | 13 47.3 | + 4 54.5 | -0.0401 | 0.5541 | -0.0042 | +39 | -17 |
| 39 Geminorum | 6.3 | 0.44 | 3.7 | 26 13.4 | 15 19.8 | + 6 23.7 | -0.8285 | 0.5541 | 0.0079 | - 7 | -64 |
| 40 Geminorum | 6.3 | +0.44 | + 3.6 | +26 3.8 | 15 37.5 | + 6 40.8 | -0.6551 | 0.5541 | -0.0086 | + 4 | -57 |
| ω Geminorum | 5.7 | 0.45 | 3.2 | 24 22.2 | 16 58.9 | + 7 59.4 | +1.1845 | 0.5534 | 0.0117 | +90 | +55 |
| 45 Geminorum | 6.0 | 0.49 | 3.0 | 24 18.7 | 21 28.3 | -11 40.5 | +1.1760 | 0.5529 | 0.0221 | +90 | +54 |
| 52 Geminorum | 6.3 | 0.51 | 3.1 | 25 4.4 | 22 28.0 | -10 42.8 | +0.3163 | 0.5525 | 0.0245 | +61 | 0 |
| A Geminorum | 5.7 | 0.55 | 3.0 | 25 15.5 | 19 2 25.0 | - 6 54.0 | 0.0000 | 0.5521 | 0.0333 | +41 | -17 |
| κ Geminor. <i>mult.</i> | 3.6 | +0.63 | + 2.5 | +24 39.6 | 11 56.0 | + 2 17.5 | +0.2367 | 0.5489 | -0.0549 | +56 | - 8 |
| ω^2 Cancri | 6.3 | 0.70 | 2.3 | 25 23.4 | 19 50.4 | + 9 56.0 | -1.0700 | 0.5464 | 0.0720 | -26 | -65 |
| λ Cancri | 5.7 | 0.75 | 1.6 | 24 21.9 | 20 4 34.9 | - 5 37.1 | -0.6501 | 0.5429 | 0.0904 | + 4 | -62 |
| ν^2 Cancri | 5.8 | 0.78 | + 1.3 | 24 30.3 | 8 21.8 | - 1 57.7 | -1.1620 | 0.5410 | 0.0980 | -34 | -65 |
| ξ Cancri | 5.0 | 0.87 | - 0.3 | 22 29.2 | 21 3 52.3 | - 7 4.9 | -1.2090 | 0.5328 | 0.1348 | -38 | -68 |
| 79 Cancri | 6.3 | +0.88 | - 0.4 | +22 26.3 | 4 21.4 | - 6 36.7 | -1.2260 | 0.5326 | -0.1355 | -40 | -68 |
| B. A. C. 3138 | 6.3 | 0.88 | 0.6 | 21 43.9 | 5 57.8 | - 5 3.3 | -0.6563 | 0.5311 | 0.1383 | + 5 | -67 |
| B. A. C. 3206 | 6.3 | 0.89 | 1.0 | 20 15.5 | 11 27.5 | + 0 16.1 | +0.1927 | 0.5292 | 0.1478 | +53 | -20 |
| η Leonis | 3.3 | 0.91 | 2.5 | 17 17.6 | 22 8 55.6 | - 2 55.1 | -0.0315 | 0.5180 | 0.1792 | +40 | -35 |
| 42 Leonis | 6.0 | 0.89 | 3.0 | 15 31.5 | 16 26.8 | + 4 22.7 | +0.5511 | 0.5154 | 0.1891 | +77 | - 6 |
| <i>i</i> Leonis | 5.7 | +0.88 | - 3.3 | +14 41.8 | 21 52.3 | + 9 38.7 | +0.4304 | 0.5131 | -0.1952 | +68 | -13 |
| <i>k</i> Leonis | 5.7 | +0.87 | - 3.8 | +14 46.2 | 23 5 23.6 | - 7 2.9 | -1.1500 | 0.5099 | -0.2030 | -27 | -75 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | | Limiting Parallels. | |
|------------------------|------|------------------------|----------------|--------------------------|--------------------------|------------------------|----------|-----------|-----------|------------|------------------------|--|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle <i>H</i> | <i>Y</i> | <i>z'</i> | <i>y'</i> | N. | S. | |
| | | $\Delta\alpha$ | $\Delta\delta$ | | | | | | | | | |
| | | α | δ | | d h m | h m | | | | $^{\circ}$ | $^{\circ}$ | |
| ω Virginis | 5.9 | +0.80 | -5.2 | + 8 44.2 | 24 9 35.6 | - 3 38.5 | -0.5064 | 0.5005 | -0.2256 | +10 | -67 | |
| ν Virginis | 4.0 | 0.78 | 5.0 | 7 8.3 | 13 40.4 | + 0 19.5 | +0.3408 | 0.5002 | 0.2280 | +57 | -17 | |
| c Virginis | 5.5 | 0.69 | 5.4 | 3 55.1 | 25 8 49.2 | - 5 3.1 | -0.5277 | 0.4969 | 0.2353 | + 8 | -70 | |
| B. A. C. 4254 | 6.1 | 0.63 | 5.7 | + 2 27.2 | 18 50.4 | + 4 41.8 | -1.2750 | 0.4964 | 0.2372 | -46 | -88 | |
| 65 Virginis | 6.1 | 0.47 | 5.1 | - 4 21.4 | 26 19 39.8 | + 4 50.3 | +0.3443 | 0.5011 | 0.2359 | +60 | -23 | |
| 66 Virginis | 6.0 | +0.47 | -5.1 | - 4 35.7 | 20 19.8 | + 5 29.3 | +0.4487 | 0.5011 | -0.2359 | +68 | -18 | |
| ν Virginis | 5.1 | 0.44 | 5.0 | 5 41.7 | 27 0 23.5 | + 9 26.2 | +0.7003 | 0.5012 | 0.2346 | +84 | - 5 | |
| 80 Virginis | 6.1 | 0.43 | 5.2 | 4 50.5 | 2 19.8 | +11 19.2 | -0.6910 | 0.5013 | 0.2342 | + 5 | -89 | |
| 88 Virginis | 6.8 | 0.37 | 5.0 | 6 17.7 | 9 14.6 | - 5 57.5 | -0.7063 | 0.5035 | 0.2316 | + 4 | -91 | |
| B.A.C.4647 <i>mult</i> | 6.4 | 0.34 | 4.8 | 7 31.4 | 12 49.5 | - 2 28.7 | -0.1894 | 0.5045 | 0.2297 | +39 | -52 | |
| W. xiii, 825 | 6.8 | +0.33 | -4.4 | - 9 1.6 | 13 14.5 | - 2 4.4 | +1.3570 | 0.5046 | -0.2296 | +81 | +48 | |
| 94 Virginis | 6.8 | 0.30 | 4.7 | 8 22.4 | 18 50.8 | + 3 22.4 | -0.6346 | 0.5068 | 0.2266 | + 7 | -84 | |
| 95 Virginis | 6.0 | 0.29 | 4.6 | 8 47.7 | 19 4.3 | + 3 35.5 | -0.2255 | 0.5070 | 0.2264 | +27 | -54 | |
| 96 Virginis | 6.9 | 0.28 | 4.4 | 9 49.2 | 20 16.2 | + 4 45.3 | +0.6255 | 0.5077 | 0.2260 | +77 | - 8 | |
| κ Virginis | 4.2 | 0.27 | 4.4 | 9 46.1 | 22 19.2 | + 6 44.7 | +0.1034 | 0.5081 | 0.2246 | +45 | -36 | |
| γ Libræ | 6.5 | +0.22 | -4.2 | -11 13.1 | 28 3 49.6 | -11 54.5 | +0.4547 | 0.5107 | -0.2207 | +65 | -18 | |
| μ Libræ | 5.7 | +0.11 | -3.7 | -13 41.7 | 17 6.2 | + 0 58.6 | +0.2793 | 0.5183 | -0.2096 | +53 | -26 | |

MARCH.

| | | | | | | | | | | | |
|---------------------------------|-----|-------|------|----------|-----------|----------|---------|--------|---------|-----|-----|
| ν^1 Libræ | 5.5 | +0.03 | -3.2 | -15 50.1 | 1 1 44.2 | + 9 20.8 | +0.8150 | 0.5244 | -0.2007 | +74 | + 3 |
| ν^2 Libræ | 6.9 | +0.03 | 3.1 | 16 3.8 | 1 49.7 | + 9 26.2 | +1.0410 | 0.5244 | 0.2007 | +74 | +18 |
| α^1 Libræ | 6.4 | -0.03 | 4.0 | 15 9.4 | 8 48.3 | - 7 48.3 | -1.3040 | 0.5238 | 0.1923 | -50 | -90 |
| ζ^1 Libræ | 6.0 | 0.07 | 3.4 | 16 20.3 | 12 17.1 | - 4 26.1 | -0.6947 | 0.5309 | 0.1923 | - 3 | -90 |
| ζ^2 Libræ | 7.0 | 0.08 | 3.2 | 17 4.0 | 12 54.9 | - 3 49.5 | -0.0339 | 0.5317 | 0.1872 | +32 | -43 |
| ζ^3 Libræ | 6.0 | -0.08 | -3.5 | -16 14.1 | 13 26.9 | - 3 18.5 | -1.0230 | 0.5323 | -0.1863 | -24 | -90 |
| ζ^4 Libræ | 5.8 | 0.09 | 3.4 | 16 29.1 | 14 31.3 | - 2 16.3 | -0.9554 | 0.5325 | 0.1847 | -19 | -90 |
| 41 Libræ | 5.9 | 0.14 | 2.7 | 18 56.6 | 17 19.5 | + 0 26.6 | +1.1620 | 0.5350 | 0.1809 | +71 | +30 |
| κ Libræ | 5.1 | 0.15 | 3.3 | 19 19.6 | 18 45.7 | + 1 49.9 | +1.3075 | 0.5358 | 0.1788 | +71 | +49 |
| λ Libræ | 5.1 | 0.21 | 2.6 | 19 50.5 | 20 5.3 | + 6 59.1 | +0.9253 | 0.5407 | 0.1711 | +70 | +11 |
| 47 Libræ | 6.4 | -0.22 | -2.8 | -19 3.7 | 0 52.8 | + 7 45.0 | -0.0408 | 0.5414 | -0.1698 | +29 | -44 |
| β^1 Scorpii | 2.9 | 0.26 | 2.8 | 19 30.5 | 5 40.5 | -11 36.9 | -0.3592 | 0.5449 | 0.1620 | +12 | -63 |
| β^2 Scorpii | 5.5 | 0.26 | 2.8 | 19 30.3 | 5 40.6 | -11 36.8 | -0.3628 | 0.5449 | 0.1620 | +12 | -64 |
| ω^1 Scorpii | 4.6 | 0.27 | 2.6 | 20 22.5 | 6 17.1 | -11 1.5 | +0.4620 | 0.5454 | 0.1611 | +56 | -16 |
| ω^2 Scorpii | 4.6 | 0.28 | 2.5 | 20 34.5 | 6 33.0 | -10 46.1 | +0.6336 | 0.5459 | 0.1603 | +66 | - 6 |
| ν^2 Scorpii | 4.2 | -0.30 | -3.1 | -19 10.8 | 8 40.1 | - 8 43.4 | -1.1820 | 0.5471 | -0.1567 | -40 | -90 |
| ω Ophiuchi | 4.7 | 0.40 | 2.7 | 21 14.0 | 17 38.0 | - 0 4.0 | -0.3410 | 0.5546 | 0.1403 | +10 | -62 |
| 22 Ophiuchi | 6.7 | 0.52 | 2.2 | 23 19.9 | 3 28.0 | + 9 25.0 | +0.5804 | 0.5636 | 0.1202 | +60 | - 9 |
| 24 Ophiuchi | 6.0 | 0.53 | 2.4 | 22 58.6 | 4 18.6 | +10 14.0 | +0.1080 | 0.5636 | 0.1180 | +31 | -35 |
| 39 Ophiuchi <i>mult.</i> | 5.5 | 0.64 | 2.3 | 24 10.1 | 13 14.5 | - 5 10.0 | +0.3802 | 0.5708 | 0.0983 | +45 | -20 |
| B. A. C. 5831 | 6.5 | -0.64 | -2.4 | -23 57.1 | 13 17.0 | - 5 7.6 | +0.1510 | 0.5708 | -0.0983 | +31 | -33 |
| θ Ophiuchi | 3.3 | 0.67 | 2.2 | 24 53.5 | 14 53.3 | - 3 34.8 | +0.9757 | 0.5725 | 0.0946 | +65 | +17 |
| b Ophiuchi <i>var.</i> | 4.4 | 0.71 | 2.6 | 24 4.5 | 16 42.7 | - 1 49.5 | -0.0433 | 0.5734 | 0.0901 | +20 | -44 |
| c^2 Ophiuchi | 5.2 | 0.70 | 2.7 | 23 52.7 | 18 47.5 | + 0 10.5 | -0.4308 | 0.5749 | 0.0849 | - 1 | -70 |
| 63 Ophiuchi | 6.6 | 0.82 | 2.6 | 24 51.9 | 4 4 18.7 | + 9 20.0 | -0.1048 | 0.5813 | 0.0612 | +14 | -48 |
| 7 Sagittarii | 5.9 | -0.85 | -3.0 | -24 16.8 | 7 30.3 | -11 35.9 | -0.8866 | 0.5848 | -0.0524 | -29 | -90 |
| 9 Sagittarii | 6.0 | 0.86 | 3.0 | 24 21.8 | 7 54.7 | -11 12.5 | -0.8216 | 0.5848 | 0.0513 | -25 | -90 |
| λ Sagittarii | 2.9 | 0.98 | 3.2 | 25 28.8 | 17 24.5 | - 2 5.2 | -0.0341 | 0.5903 | 0.0250 | +15 | -43 |
| B. A. C. 6369 | 6.2 | 1.05 | 3.8 | 25 7.1 | 23 58.4 | + 4 13.0 | -0.5076 | 0.5936 | -0.0051 | -12 | -76 |
| σ Sagittarii | 2.3 | 1.11 | 3.8 | 26 26.0 | 5 3 59.0 | + 8 3.8 | +0.8288 | 0.5956 | +0.0053 | +64 | + 7 |
| ψ Sagittarii | 5.4 | -1.18 | -4.5 | -25 26.7 | 11 47.0 | - 8 27.4 | -0.0438 | 0.5977 | +0.0284 | +14 | -44 |
| χ^1 Sagittarii | 5.4 | 1.22 | 5.0 | 24 43.3 | 15 31.0 | - 4 52.3 | -0.6522 | 0.5983 | 0.0394 | -17 | -90 |
| χ^2 Sagittarii | 6.3 | 1.22 | 5.0 | 24 37.6 | 15 33.4 | - 4 50.1 | -0.7445 | 0.5983 | 0.0396 | -22 | -90 |
| χ^3 Sagittarii | 5.6 | 1.22 | 5.1 | 24 10.7 | 15 36.7 | - 4 46.9 | -1.1930 | 0.5983 | 0.0396 | -54 | -90 |
| η^1 Sagittarii <i>var.</i> | 6.0 | 1.26 | 5.1 | 24 57.6 | 19 36.5 | - 0 57.1 | -0.2216 | 0.5984 | 0.0516 | + 7 | -55 |
| λ^2 Sagittarii | 4.6 | -1.26 | -5.2 | -25 7.5 | 19 51.8 | - 0 42.4 | -0.0420 | 0.5994 | +0.0522 | +17 | -44 |
| 17 Capricorni | 6.0 | -1.47 | -7.7 | -21 54.7 | 6 22 23.2 | + 0 43.5 | -0.8312 | 0.5978 | +0.1287 | -19 | -90 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | Limiting Parallels. | |
|------------------------|------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|---------|------------------------|-----|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | x' | y' | N. | S. |
| | | $\Delta\alpha$ | $\Delta\delta$ | | d h m | h m | | | | | |
| χ Capricorni | 5.4 | -1.51 | -8.2 | -21° 38.1 | 7 7 12 | + 9 0.6 | +0.1038 | 0.5954 | +0.1511 | +33 | -36 |
| 27 Capricorni | 6.5 | 1.51 | 8.4 | 20 59.8 | 7 24.3 | + 9 22.7 | -0.4678 | 0.5954 | 0.1517 | + 4 | -72 |
| ϕ Capricorni | 5.5 | 1.52 | 8.5 | 21 6.5 | 9 46.1 | +11 38.8 | +0.0083 | 0.5940 | 0.1582 | +28 | -41 |
| 33 Capricorni | 5.7 | 1.53 | 8.6 | 21 19.1 | 13 5.3 | - 9 10.1 | +0.7519 | 0.5925 | 0.1660 | +66 | + 1 |
| 37 Capricorni | 6.0 | 1.55 | 9.0 | 20 34.4 | 17 17.1 | - 5 8.3 | +0.7377 | 0.5906 | 0.1761 | +69 | - 1 |
| ϵ Capricorni | 4.7 | -1.54 | -9.1 | -19 57.5 | 18 10.0 | - 4 17.5 | +0.2885 | 0.5905 | +0.1780 | +46 | -26 |
| κ Capricorni | 5.0 | 1.54 | 9.3 | -19 21.9 | 20 21.6 | - 2 11.2 | +0.1000 | 0.5899 | 0.1835 | +36 | -36 |
| NEW MOON. | | | | | | | | | | | |
| 26 Ceti | 5.9 | 1.51 | 9.2 | + 0 46.9 | 11 9 23.5 | + 7 43.1 | +0.9933 | 0.5536 | 0.2656 | +90 | +12 |
| 29 Ceti | 6.3 | -1.51 | -9.0 | + 1 25.3 | 11 15.1 | + 9 30.8 | +0.8547 | 0.5539 | +0.2654 | +90 | + 5 |
| 33 Ceti | 6.1 | 1.50 | 8.9 | 1 51.9 | 12 18.6 | +10 32.0 | +0.7226 | 0.5533 | 0.2647 | +90 | - 4 |
| 35 Ceti | 6.3 | 1.50 | 8.9 | 1 53.6 | 13 17.0 | +11 28.5 | +0.9272 | 0.5531 | 0.2643 | +90 | + 9 |
| f Piscium | 5.1 | 1.49 | 8.5 | 3 2.3 | 15 38.1 | -10 15.4 | +0.4148 | 0.5531 | 0.2634 | +66 | -20 |
| μ Piscium | 5.0 | 1.48 | 7.8 | 5 34.7 | 21 8.6 | - 4 56.1 | -0.6650 | 0.5527 | 0.2605 | + 7 | -83 |
| ν Piscium | 4.6 | -1.44 | -7.7 | + 4 56.1 | 12 2 12.6 | - 0 2.6 | +1.2870 | 0.5518 | +0.2569 | +90 | +38 |
| ξ Arietis | 5.3 | 1.34 | 5.4 | 10 6.9 | 21 37.7 | - 5 17.5 | +0.9276 | 0.5511 | 0.2380 | +90 | +12 |
| B. A. C. 755 | 6.5 | 1.34 | 5.3 | 10 4.3 | 22 30.0 | - 4 27.1 | +1.1790 | 0.5507 | 0.2370 | +90 | +30 |
| 31 Arietis | 5.7 | 1.32 | 4.5 | 11 58.4 | 13 2 53.0 | - 0 12.9 | +0.2850 | 0.5514 | 0.2315 | +58 | -23 |
| 38 Arietis | 5.0 | 1.29 | 4.3 | 11 59.1 | 6 37.0 | + 3 23.5 | +1.1350 | 0.5521 | 0.2268 | +90 | +28 |
| σ Arietis | 5.5 | -1.29 | -3.3 | +14 37.9 | 9 30.1 | + 6 10.6 | -0.9067 | 0.5524 | +0.2227 | - 8 | -75 |
| 13 Tauri | 5.7 | 1.11 | 0.4 | 19 21.0 | 14 7 58.2 | + 3 52.0 | -1.1570 | 0.5551 | 0.1854 | -30 | -72 |
| 14 Tauri | 6.3 | 1.10 | -0.3 | 19 19.2 | 8 37.0 | + 4 29.3 | -1.0060 | 0.5550 | 0.1842 | -17 | -71 |
| B. A. C. 1242 | 6.3 | 1.02 | +0.3 | 19 53.6 | 16 13.5 | +11 49.9 | -0.2577 | 0.5558 | 0.1695 | +27 | -45 |
| ω^1 Tauri | 6.0 | 0.97 | 0.3 | 19 19.2 | 19 45.6 | - 8 45.5 | +0.9270 | 0.5569 | 0.1626 | +90 | +21 |
| NEPTUNE | | | | +19 26.0 | 23 4.5 | - 5 34.0 | +1.3210 | 0.5563 | +0.1556 | +90 | +63 |
| ω^2 Tauri | 5.7 | -0.93 | +0.9 | 20 18.6 | 23 17.4 | - 5 21.2 | +0.4574 | 0.5572 | 0.1551 | +71 | - 6 |
| 51 Tauri | 6.0 | 0.94 | 1.2 | 21 18.8 | 23 45.7 | - 4 54.2 | -0.5183 | 0.5572 | 0.1541 | +13 | -59 |
| 53 Tauri | 6.0 | 0.93 | 1.1 | 20 52.7 | 15 0 13.5 | - 4 27.1 | +0.0070 | 0.5578 | 0.1533 | +42 | -28 |
| 56 Tauri | 6.0 | 0.93 | 1.3 | 21 30.6 | 0 17.5 | - 4 23.3 | -0.6428 | 0.5578 | 0.1533 | + 6 | -66 |
| κ^1 Tauri | 4.7 | -0.91 | +1.6 | +22 2.6 | 2 47.4 | - 1 58.7 | -0.8239 | 0.5578 | +0.1476 | - 5 | -68 |
| κ^2 Tauri | 6.3 | 0.91 | 1.6 | 21 57.0 | 2 49.0 | - 1 57.3 | -0.7242 | 0.5584 | 0.1478 | + 1 | -68 |
| B. A. C. 1373 | 6.0 | 0.89 | 1.5 | 21 22.4 | 3 57.4 | - 0 51.1 | +0.0471 | 0.5584 | 0.1454 | +45 | -25 |
| τ Tauri | 4.5 | 0.82 | 2.2 | 22 44.9 | 10 8.0 | + 5 6.1 | -0.5412 | 0.5585 | 0.1317 | +12 | -58 |
| 99 Tauri | 6.0 | 0.73 | 3.1 | 23 46.6 | 16 52.2 | +11 36.1 | -0.7887 | 0.5598 | 0.1167 | + 4 | -66 |
| 103 Tauri | 6.0 | -0.67 | +3.2 | +24 7.2 | 21 19.8 | - 8 6.0 | -0.6561 | 0.5593 | +0.1066 | + 5 | -63 |
| 118 Tauri | 5.7 | 0.55 | 4.1 | 25 3.7 | 16 6 28.7 | + 0 43.3 | -0.7852 | 0.5604 | 0.0850 | - 4 | -65 |
| 121 Tauri | 6.0 | 0.50 | 3.8 | 23 57.9 | 9 10.7 | + 3 19.4 | +0.6049 | 0.5604 | 0.0787 | +86 | +10 |
| 132 Tauri | 5.3 | 0.41 | 4.4 | 24 31.8 | 15 2.7 | + 8 58.9 | +0.4250 | 0.5599 | 0.0645 | +70 | + 3 |
| 139 Tauri | 5.3 | 0.36 | 4.9 | 25 56.4 | 18 54.4 | -11 17.7 | -0.8588 | 0.5597 | 0.0554 | - 9 | -64 |
| 5 Geminorum | 6.7 | -0.28 | +4.5 | +24 26.7 | 17 0 49.6 | - 5 35.2 | +1.0340 | 0.5591 | +0.0407 | +90 | +40 |
| ϵ Geminorum | 3.2 | 0.07 | 4.7 | 25 14.3 | 14 57.7 | + 8 2.9 | +0.5171 | 0.5569 | +0.0067 | +77 | +12 |
| 37 Geminorum | 6.3 | -0.01 | 4.6 | 25 30.7 | 19 58.1 | -11 7.3 | +0.2265 | 0.5555 | -0.0054 | +55 | - 3 |
| 39 Geminorum | 6.3 | +0.01 | 4.9 | 26 13.4 | 21 29.8 | - 9 38.8 | -0.5580 | 0.5546 | 0.0090 | +10 | -49 |
| 40 Geminorum | 6.3 | 0.02 | 4.9 | 26 3.8 | 21 47.3 | - 9 21.9 | -0.3877 | 0.5546 | 0.0096 | +20 | -37 |
| 52 Geminorum | 6.3 | +0.11 | +4.4 | +25 4.4 | 18 4 34.0 | - 2 49.4 | +0.5710 | 0.5530 | -0.0256 | +83 | +13 |
| A Geminorum | 5.7 | 0.16 | 4.4 | 25 15.5 | 8 29.4 | + 0 57.8 | +0.2496 | 0.5514 | 0.0348 | +57 | - 5 |
| c Geminorum | 6.0 | 0.29 | 4.3 | 26 2.6 | 17 46.2 | + 9 55.5 | -1.0310 | 0.5484 | 0.0560 | -22 | -64 |
| κ Geminor. mult | 3.6 | 0.29 | 4.1 | 24 39.6 | 17 57.1 | +10 6.0 | +0.4753 | 0.5482 | 0.0564 | +74 | + 6 |
| ω^1 Cancri | 6.0 | 0.39 | 4.0 | 25 41.4 | 19 1 27.1 | - 6 39.1 | -1.1360 | 0.5453 | 0.0729 | -32 | -61 |
| ω^2 Cancri | 6.3 | +0.40 | +3.9 | +25 23.4 | 1 49.8 | - 6 17.4 | -0.8371 | 0.5450 | -0.0734 | - 8 | -65 |
| λ Cancri | 5.7 | 0.50 | 3.0 | 24 21.9 | 10 33.3 | + 2 8.7 | -0.4339 | 0.5416 | 0.0917 | +16 | -46 |
| ν^1 Cancri | 5.8 | 0.54 | 3.1 | 24 30.3 | 14 20.1 | + 5 48.1 | -0.9486 | 0.5408 | 0.0995 | -15 | -65 |
| ν^2 Cancri | 6.0 | 0.55 | 3.0 | 24 26.9 | 15 42.1 | + 7 7.4 | -1.0240 | 0.5408 | 0.1021 | -21 | -66 |
| ν^3 Cancri | 5.7 | 0.56 | 3.1 | 24 27.3 | 16 24.0 | + 7 47.9 | -1.1050 | 0.5379 | 0.1038 | -28 | -66 |
| ξ Cancri | 5.0 | +0.73 | +1.6 | +22 29.2 | 20 9 51.7 | + 0 42.0 | -1.0290 | 0.5303 | -0.1360 | -20 | -68 |
| 79 Cancri | 6.3 | +0.73 | +1.6 | +22 26.3 | 10 23.7 | + 1 10.0 | -1.0450 | 0.5303 | -0.1370 | -21 | -63 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | | Limiting Parallels. | |
|----------------------------|------|------------------------|----------------|--------------------------|--------------------------|----------------|---------|--------|---------|-----|------------------------|--|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | HourAngle H | Y | z' | y' | N. | S. | |
| | | $\Delta\alpha$ | $\Delta\delta$ | | | | | | | | | |
| B. A. C. 3138 | 6.3 | +0.74 | +1.3 | +21 43.9 | 20 11 57.4 | + 2 43.7 | -0.4844 | 0.5294 | -0.1398 | +15 | -56 | |
| B. A. C. 3206 | 6.3 | 0.77 | +0.6 | 20 15.5 | 17 28.0 | + 8 4.0 | +0.3550 | 0.5260 | 0.1490 | +63 | -11 | |
| η Leonis | 3.3 | 0.89 | -1.3 | 17 17.6 | 21 15 0.4 | + 4 56.8 | +0.0870 | 0.5158 | 0.1807 | +46 | -28 | |
| 42 Leonis | 6.0 | 0.90 | 2.1 | 15 31.5 | 22 32.6 | -11 44.1 | +0.6519 | 0.5130 | 0.1902 | +88 | 0 | |
| i Leonis | 5.7 | 0.93 | 2.5 | 14 41.8 | 22 3 58.9 | - 6 27.2 | +0.5186 | 0.5107 | 0.1967 | +75 | - 9 | |
| k Leonis | 5.7 | +0.95 | -3.1 | +14 46.2 | 11 31.3 | + 0 52.2 | -1.0760 | 0.5078 | -0.2044 | -20 | -75 | |
| ω Virginis | 5.9 | 0.99 | 5.3 | 8 44.2 | 23 15 44.9 | + 4 18.3 | -0.5066 | 0.4996 | 0.2278 | +15 | -72 | |
| ν Virginis | 4.0 | 0.99 | 5.6 | 7 8.3 | 19 49.9 | + 8 16.2 | +0.3309 | 0.4995 | 0.2304 | +61 | -23 | |
| c Virginis | 5.5 | 0.99 | 6.0 | + 3 55.1 | 24 14 56.4 | + 2 51.3 | -0.5875 | 0.4974 | 0.2382 | +11 | -79 | |
| 65 Virginis | 6.1 | 0.93 | 7.4 | - 4 21.4 | 26 1 37.8 | -11 24.2 | +0.1993 | 0.5013 | 0.2390 | +52 | -31 | |
| 66 Virginis | 6.0 | +0.92 | -7.4 | - 4 35.7 | 2 17.5 | -10 45.6 | +0.3035 | 0.5016 | -0.2390 | +58 | -26 | |
| 72 Virginis | 5.1 | 0.92 | 7.4 | 5 41.7 | 6 19.9 | - 6 49.9 | +0.5466 | 0.5031 | 0.2380 | +74 | -13 | |
| 80 Virginis | 6.1 | 0.91 | 7.5 | 4 50.5 | 8 15.5 | - 4 57.6 | -0.8464 | 0.5040 | 0.2375 | - 5 | -90 | |
| 88 Virginis | 6.8 | 0.88 | 7.6 | 6 17.7 | 15 8.1 | + 1 43.4 | -0.8762 | 0.5050 | 0.2345 | - 7 | -90 | |
| B. A. C. 4647 <i>mult.</i> | 6.4 | 0.87 | 7.5 | 7 31.4 | 18 41.8 | + 5 11.0 | -0.3643 | 0.5068 | 0.2330 | +22 | -63 | |
| W. xiii, 825 | 6.8 | +0.87 | -7.3 | - 9 1.6 | 19 6.8 | + 5 35.3 | +1.1800 | 0.5069 | -0.2328 | +81 | +27 | |
| 94 Virginis | 6.8 | 0.85 | 7.4 | 8 22.4 | 27 0 41.4 | +11 0.3 | -0.8235 | 0.5089 | 0.2296 | - 5 | -90 | |
| 95 Virginis | 6.0 | 0.85 | 7.4 | 8 47.7 | 0 54.9 | +11 13.5 | -0.4164 | 0.5091 | 0.2296 | +18 | -66 | |
| 96 Virginis | 6.9 | 0.84 | 7.2 | 9 49.2 | 2 6.3 | -11 37.2 | +0.4309 | 0.5098 | 0.2288 | +64 | -19 | |
| κ Virginis | 4.2 | 0.84 | 7.3 | 9 46.1 | 4 8.9 | - 9 38.2 | - 0.925 | 0.5101 | 0.2272 | +35 | -47 | |
| 2 Libræ | 6.5 | +0.81 | -7.1 | -11 13.1 | 9 37.8 | - 4 18.9 | +0.2519 | 0.5125 | -0.2235 | +53 | -28 | |
| μ Libræ | 5.7 | 0.76 | 6.7 | 13 41.7 | 22 51.8 | + 8 31.6 | +0.0542 | 0.5198 | 0.2119 | +39 | -39 | |
| ν Libræ | 5.5 | 0.72 | 6.5 | 15 50.1 | 28 7 29.0 | - 7 7.0 | +0.5790 | 0.5253 | 0.2025 | +69 | -11 | |
| ν^2 Libræ | 6.9 | 0.72 | 6.1 | 16 3.8 | 7 34.5 | - 7 1.7 | +0.8074 | 0.5253 | 0.2025 | +74 | + 2 | |
| 28 Libræ | 6.0 | 0.68 | 5.8 | 17 45.9 | 14 26.8 | - 0 22.2 | +1.2775 | 0.5294 | 0.1940 | +72 | +41 | |
| ζ^1 Libræ | 6.0 | +0.66 | -6.2 | -16 20.3 | 18 2.0 | + 3 6.2 | -0.9445 | 0.5316 | -0.1892 | -18 | -90 | |
| ζ^2 Libræ | 7.0 | 0.65 | 6.0 | 17 4.0 | 18 39.8 | + 3 42.8 | -0.2814 | 0.5322 | 0.1826 | +19 | -58 | |
| ζ^3 Libræ | 6.0 | 0.65 | 6.2 | 16 14.1 | 19 11.9 | + 4 13.8 | -1.2750 | 0.5326 | 0.1878 | -47 | -90 | |
| ζ^4 Libræ | 5.8 | 0.64 | 6.4 | 16 29.1 | 20 16.4 | + 5 16.2 | -1.2080 | 0.5336 | 0.1864 | -39 | -90 | |
| 41 Libræ | 5.9 | 0.61 | 5.5 | 18 56.6 | 23 5.0 | + 7 59.5 | +0.9158 | 0.5352 | 0.1821 | +71 | +10 | |
| κ Libræ | 5.1 | +0.60 | -5.4 | -19 19.6 | 29 0 31.4 | + 9 23.0 | +1.0670 | 0.5365 | -0.1803 | +71 | +21 | |
| λ Libræ | 5.1 | 0.57 | 5.2 | 19 50.5 | 5 52.2 | - 9 26.6 | +0.6738 | 0.5396 | 0.1717 | +70 | - 5 | |
| 47 Libræ | 6.4 | 0.56 | 5.4 | 19 3.7 | 6 39.8 | - 8 40.6 | -0.2959 | 0.5405 | 0.1706 | +16 | -60 | |
| β^1 Scorpii | 2.9 | 0.54 | 5.5 | 19 30.5 | 11 29.2 | - 4 0.8 | -0.6210 | 0.5439 | 0.1627 | - 3 | -86 | |
| β^2 Scorpii | 5.5 | 0.54 | 5.5 | 19 30.3 | 11 29.2 | - 4 0.8 | -0.6246 | 0.5439 | 0.1627 | - 3 | -86 | |
| ω^1 Scorpii | 4.6 | +0.52 | -5.1 | -20 22.5 | 12 5.9 | - 3 25.3 | +0.2046 | 0.5441 | -0.1615 | +41 | -31 | |
| ω^2 Scorpii | 4.6 | 0.52 | 5.1 | 20 34.5 | 12 21.9 | - 3 9.9 | +0.3754 | 0.5444 | 0.1611 | +51 | -21 | |
| ω Ophiuchi | 4.7 | 0.43 | 4.9 | 21 14.0 | 23 32.2 | + 7 37.6 | -0.6088 | 0.5525 | 0.1405 | - 4 | -85 | |
| 22 Ophiuchi | 6.7 | 0.34 | 4.1 | 23 20.0 | 30 9 28.9 | - 6 46.7 | +0.3192 | 0.5600 | 0.1203 | +43 | -24 | |
| 24 Ophiuchi | 6.0 | 0.33 | 4.1 | 22 58.7 | 10 29.1 | - 5 57.2 | -0.1588 | 0.5608 | 0.1183 | +17 | -51 | |
| 39 Ophiuchi <i>mult.</i> | 5.5 | +0.24 | -3.7 | -24 10.2 | 19 24.0 | + 2 47.0 | +0.1193 | 0.5665 | -0.0979 | +29 | -35 | |
| B. A. C. 5831 | 6.5 | 0.25 | 3.7 | 23 57.2 | 19 26.6 | + 2 49.5 | -0.1140 | 0.5665 | 0.0977 | +17 | -48 | |
| θ Ophiuchi | 3.3 | 0.23 | 3.4 | 24 53.6 | 21 4.4 | + 4 23.7 | +0.7192 | 0.5665 | 0.0941 | +65 | - 1 | |
| b Ophiuchi <i>var.</i> | 4.4 | 0.21 | 3.8 | 24 4.6 | 22 55.6 | + 6 10.8 | -0.3275 | 0.5665 | 0.0895 | + 6 | -62 | |
| c Ophiuchi | 5.2 | 0.19 | 3.7 | 23 52.8 | 31 1 2.9 | + 8 13.4 | -0.7023 | 0.5706 | 0.0844 | -15 | -90 | |
| 63 Ophiuchi | 6.6 | +0.09 | -3.1 | -24 52.0 | 10 45.4 | - 6 25.9 | -0.3668 | 0.5747 | -0.0600 | + 1 | -65 | |
| 7 Sagittarii | 5.9 | 0.05 | 3.2 | 24 16.9 | 14 1.4 | - 3 17.4 | -1.1610 | 0.5774 | 0.0515 | -50 | -90 | |
| 9 Sagittarii | 6.0 | +0.04 | -3.2 | -24 21.9 | 14 26.2 | - 2 53.5 | -1.0910 | 0.5774 | -0.0504 | -44 | -90 | |

APRIL.

| | | | | | | | | | | | |
|----------------------|-----|-------|------|----------|---------|----------|---------|--------|---------|-----|-----|
| λ Sagittarii | 2.9 | -0.07 | -2.8 | -25 28.9 | 1 0 9.8 | + 6 27.7 | -0.2941 | 0.5825 | -0.0244 | + 2 | -60 |
| B. A. C. 6369 | 6.2 | 0.16 | 3.1 | 25 7.2 | 6 54.5 | -11 3.4 | -0.7689 | 0.5848 | -0.0086 | -26 | -90 |
| σ Sagittarii | 2.3 | 0.21 | 2.9 | 26 26.0 | 11 1.6 | - 7 5.9 | +0.5876 | 0.5853 | +0.0058 | +51 | - 8 |
| ψ Sagittarii | 5.4 | 0.31 | 3.1 | 25 26.7 | 19 3.6 | + 0 37.1 | -0.2945 | 0.5878 | 0.0285 | + 2 | -60 |
| χ^1 Sagittarii | 5.4 | -0.36 | -3.4 | -24 43.3 | 22 54.6 | + 4 19.0 | -0.9040 | 0.5883 | +0.0395 | -33 | -90 |
| χ^2 Sagittarii | 6.3 | -0.36 | -3.5 | -24 37.6 | 22 57.1 | + 4 21.3 | -0.9998 | 0.5883 | +0.0395 | -38 | -90 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | | | Limiting Parallels. | |
|-----------------------------------|------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|---------|-----|-----|------------------------|--|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. | | |
| | | $\Delta\alpha$ | $\Delta\delta$ | | | | | | | | | | |
| α^1 Sagittarii <i>var.</i> | 6.0 | -0.41 | -3.4 | -24° 57.6 | 2 3 8.3 | + 8 22.6 | -0.4632 | 0.5880 | +0.0512 | - 6 | -73 | | |
| α^2 Sagittarii | 4.6 | 0.41 | 3.3 | 25 7.5 | 3 23.8 | + 8 37.4 | -0.2828 | 0.5880 | 0.0519 | + 5 | -59 | | |
| 17 Capricorni | 6.0 | 0.72 | 4.8 | 21 54.7 | 3 6 50.3 | +10 58.8 | -1.0530 | 0.5861 | 0.1275 | -34 | -90 | | |
| χ Capricorni | 5.4 | 0.82 | 4.9 | 21 38.0 | 15 46.8 | - 4 25.6 | -0.0920 | 0.5829 | 0.1499 | +23 | -47 | | |
| 27 Capricorni | 6.5 | 0.81 | 5.2 | 20 59.7 | 16 10.8 | - 4 2.6 | -0.6705 | 0.5827 | 0.1508 | - 8 | -90 | | |
| ϕ Capricorni | 5.5 | -0.84 | -5.1 | -21 6.4 | 18 37.6 | - 1 41.5 | -0.1823 | 0.5825 | +0.1567 | +19 | -53 | | |
| 33 Capricorni | 5.7 | 0.87 | 5.1 | 21 19.0 | 22 3.8 | + 1 36.7 | +0.5809 | 0.5813 | 0.1648 | +63 | -10 | | |
| 35 Capricorni | 6.2 | 0.88 | 5.0 | 21 40.1 | 23 18.5 | + 2 48.5 | +1.1400 | 0.5813 | 0.1678 | +68 | +29 | | |
| 37 Capricorni | 6.0 | 0.92 | 5.4 | 20 34.3 | 4 2 24.5 | + 5 47.4 | +0.5716 | 0.5795 | 0.1747 | +63 | -10 | | |
| ϵ Capricorni | 4.7 | 0.93 | 5.6 | 19 57.4 | 3 19.0 | + 6 39.8 | +0.1167 | 0.5797 | 0.1767 | +37 | -35 | | |
| κ Capricorni | 5.0 | -0.95 | -5.8 | -19 21.8 | 5 35.4 | + 8 51.0 | -0.0682 | 0.5785 | +0.1818 | +28 | -46 | | |
| B. A. C. 7550 | 6.3 | 0.96 | 5.6 | 20 7.2 | 5 49.0 | + 9 4.2 | -0.7271 | 0.5784 | 0.1822 | +70 | - 1 | | |
| 29 Aquarii <i>mult.</i> | 6.5 | 1.03 | 6.4 | 17 29.4 | 13 43.7 | - 7 20.2 | -0.3881 | 0.5747 | 0.1984 | +13 | -66 | | |
| 56 Aquarii | 6.3 | 1.12 | 7.1 | 15 8.6 | 5 1 20.8 | + 3 51.9 | -0.2876 | 0.5710 | 0.2194 | +20 | -59 | | |
| γ^1 Aquarii <i>mult.</i> | 5.8 | 1.17 | 7.3 | 14 37.9 | 8 42.3 | +10 57.1 | +0.8626 | 0.5676 | 0.2310 | +75 | + 5 | | |
| γ^2 Aquarii | 4.1 | -1.18 | -7.4 | -14 10.2 | 9 30.6 | +11 43.6 | +0.5922 | 0.5672 | +0.2322 | +71 | -10 | | |
| 74 Aquarii | 6.0 | 1.19 | 7.8 | 12 11.9 | 11 10.4 | -10 40.2 | -0.9718 | 0.5672 | 0.2346 | -16 | -90 | | |
| ψ^1 Aquarii | 4.1 | 1.25 | 8.2 | 9 40.9 | 20 46.2 | - 1 25.4 | -1.1450 | 0.5627 | 0.2465 | -27 | -90 | | |
| ψ^2 Aquarii | 4.2 | 1.26 | 8.2 | 9 46.8 | 21 39.5 | - 0 33.9 | -0.8289 | 0.5624 | 0.2476 | - 6 | -90 | | |
| ψ^3 Aquarii | 4.8 | 1.26 | 8.1 | 10 12.5 | 22 6.7 | - 0 7.8 | -0.9928 | 0.5626 | 0.2480 | +23 | -58 | | |
| B. A. C. 8274 | 7.0 | -1.32 | -8.4 | - 6 59.3 | 6 10 59.6 | -11 42.1 | -0.1924 | 0.5593 | +0.2601 | +30 | -52 | | |
| 30 Piscium | 4.6 | 1.34 | 8.4 | 6 37.3 | 16 53.4 | - 6 1.0 | +0.9899 | 0.5582 | 0.2639 | +83 | +12 | | |
| 33 Piscium | 4.7 | 1.35 | 8.4 | - 6 19.1 | 18 23.0 | - 4 34.5 | +1.0870 | 0.5576 | 0.2646 | +84 | +19 | | |
| NEW MOON. | | | | | | | | | | | | | |
| σ Arietis | 5.5 | -1.49 | -4.1 | +14 37.8 | 9 19 58.6 | - 5 32.6 | -0.7428 | 0.5586 | +0.2270 | + 2 | -74 | | |
| 13 Tauri | 5.7 | 1.40 | 1.4 | 19 20.9 | 10 17 55.3 | - 8 22.7 | -0.9524 | 0.5635 | 0.1897 | -12 | -71 | | |
| 14 Tauri | 6.3 | 1.40 | 1.3 | 19 19.1 | 18 33.0 | - 7 46.6 | -0.8024 | 0.5635 | 0.1884 | - 3 | -71 | | |
| B. A. C. 1242 | 6.3 | 1.34 | 0.6 | 19 53.6 | 11 1 57.3 | - 0 38.3 | -0.0531 | 0.5650 | 0.1735 | +39 | -33 | | |
| ω^1 Tauri | 6.0 | 1.30 | -0.4 | 19 19.2 | 5 23.4 | + 2 40.5 | +1.1220 | 0.5655 | 0.1662 | +90 | +35 | | |
| ω^2 Tauri | 5.7 | -1.28 | +0.1 | +20 18.6 | 8 49.2 | + 5 58.7 | +0.6615 | 0.5657 | +0.1586 | +90 | + 6 | | |
| 51 Tauri | 6.0 | 1.29 | 0.3 | 21 18.8 | 9 16.3 | + 6 24.9 | -0.3007 | 0.5658 | 0.1576 | +25 | -45 | | |
| 53 Tauri | 6.0 | 1.28 | 0.3 | 20 52.7 | 9 43.8 | + 6 51.3 | +0.2186 | 0.5667 | 0.1568 | +55 | -18 | | |
| 56 Tauri | 6.0 | 1.29 | 0.4 | 21 30.6 | 9 47.5 | + 6 54.8 | -0.4233 | 0.5666 | 0.1568 | +18 | -53 | | |
| κ^1 Tauri | 4.7 | 1.27 | 0.8 | 22 2.6 | 12 13.2 | + 9 15.2 | -0.6007 | 0.5657 | 0.1513 | + 8 | -63 | | |
| κ^2 Tauri | 6.3 | -1.27 | +0.8 | +21 57.0 | 12 14.5 | + 9 16.5 | -0.5007 | 0.5657 | +0.1513 | +14 | -57 | | |
| ν^1 Tauri | 4.7 | 1.27 | 0.9 | 22 33.9 | 12 36.5 | + 9 37.7 | -1.0820 | 0.5659 | 0.1501 | -24 | -67 | | |
| ν^2 Tauri | 6.0 | 1.27 | 0.9 | 22 45.0 | 13 1.5 | +10 1.3 | -1.2130 | 0.5667 | 0.1496 | -37 | -67 | | |
| B. A. C. 1373 | 6.0 | 1.25 | 0.7 | 21 22.4 | 13 21.2 | +10 20.8 | +0.2603 | 0.5670 | 0.1486 | +57 | -15 | | |
| τ Tauri | 4.5 | 1.21 | 1.5 | 22 44.9 | 19 21.0 | - 7 52.7 | -0.3131 | 0.5676 | 0.1348 | +24 | -44 | | |
| 99 Tauri | 6.0 | -1.15 | +2.3 | +23 46.6 | 19 1 53.4 | - 1 34.6 | -0.5547 | 0.5688 | +0.1195 | +11 | -57 | | |
| 103 Tauri | 6.0 | 1.10 | 2.7 | 24 7.2 | 6 13.1 | + 2 35.3 | -0.4181 | 0.5688 | 0.1089 | +18 | -48 | | |
| 118 Tauri | 5.7 | 1.00 | 3.7 | 25 3.7 | 15 6.0 | +11 8.7 | -0.5387 | 0.5688 | 0.0869 | +11 | -53 | | |
| 121 Tauri | 6.0 | 0.96 | 3.8 | 23 57.9 | 17 43.4 | -10 19.8 | +0.8331 | 0.5688 | 0.0803 | +90 | +23 | | |
| 125 Tauri | 6.0 | 0.93 | 4.2 | 25 50.2 | 19 29.0 | - 8 38.0 | -1.0020 | 0.5676 | 0.0760 | -19 | -64 | | |
| 132 Tauri | 5.3 | -0.88 | +4.1 | +24 31.8 | 23 25.3 | - 4 50.4 | +0.6567 | 0.5668 | +0.0657 | +90 | +14 | | |
| 139 Tauri | 5.3 | 0.84 | 4.7 | 25 56.4 | 13 3 10.8 | - 1 13.2 | -0.6059 | 0.5668 | 0.0561 | + 7 | -56 | | |
| 5 Geminorum | 6.7 | 0.75 | 4.5 | 24 26.8 | 8 56.4 | + 4 19.6 | +1.2630 | 0.5663 | 0.0416 | +90 | +62 | | |
| ϵ Geminorum | 3.2 | 0.56 | 5.1 | 25 14.4 | 22 43.3 | - 6 23.6 | +0.7568 | 0.5633 | +0.0066 | +90 | +25 | | |
| 37 Geminorum | 6.3 | 0.49 | 5.3 | 25 30.8 | 14 3 36.7 | - 1 40.8 | +0.4659 | 0.5610 | -0.0056 | +73 | +10 | | |
| 39 Geminorum | 6.3 | -0.48 | +5.5 | +26 13.5 | 5 6.4 | - 0 14.4 | -0.3100 | 0.5600 | -0.0091 | +24 | -32 | | |
| 40 Geminorum | 6.3 | 0.47 | 5.5 | 26 3.9 | 5 23.3 | + 0 2.0 | -0.1397 | 0.5598 | 0.0100 | +34 | -23 | | |
| 52 Geminorum | 6.3 | 0.37 | 5.3 | 25 4.5 | 12 1.8 | + 6 26.1 | +0.8089 | 0.5582 | 0.0261 | +90 | +27 | | |
| A Geminorum | 5.7 | 0.31 | 5.4 | 25 15.6 | 15 52.5 | +10 8.6 | +0.4909 | 0.5567 | 0.0353 | +75 | + 9 | | |
| c Geminorum | 6.0 | 0.17 | 5.9 | 26 2.7 | 15 0 59.2 | - 5 3.9 | -0.7825 | 0.5517 | 0.0568 | - 4 | -64 | | |
| κ Geminor. <i>mult.</i> | 3.6 | -0.16 | +5.3 | +24 39.7 | 1 9.8 | - 4 53.6 | +0.7119 | 0.5517 | -0.0571 | +90 | +18 | | |
| ω^1 Cancri | 6.0 | -0.07 | +5.7 | +25 41.5 | 8 32.7 | + 2 14.1 | -0.8927 | 0.5479 | -0.0753 | -11 | -64 | | |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

| THE STAR'S. | | | | AT CONJUNCTION IN R. A. | | | | | | Limiting Parallels. | |
|------------------------|------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|---------|------------------------|-----|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. |
| | | $\Delta\alpha$ | $\Delta\delta$ | | d h m | h m | | | | | |
| ω^2 Cancri | 6.3 | -0.05 | +5.7 | +25 23.5 | 15 8 54.9 | + 2 35.4 | -0.5928 | 0.5476 | -0.0746 | + 8 | -57 |
| λ Cancri | 5.7 | +0.06 | 5.2 | 24 22.0 | 17 31.5 | +10 54.5 | -0.1971 | 0.5433 | 0.0929 | +31 | -34 |
| ν^1 Cancri | 6.0 | 0.10 | 5.4 | 24 53.6 | 20 20.8 | -10 21.8 | -1.0440 | 0.5414 | 0.0986 | -22 | -65 |
| ν^2 Cancri | 5.8 | 0.12 | 5.3 | 24 30.4 | 21 15.5 | - 9 29.0 | -0.7117 | 0.5408 | 0.1004 | + 1 | -65 |
| ν^3 Cancri | 6.0 | 0.13 | 5.2 | 24 27.0 | 22 36.5 | - 8 10.6 | -0.7861 | 0.5404 | 0.1033 | - 3 | -66 |
| ν^4 Cancri | 5.7 | +0.14 | +5.3 | +24 27.4 | 23 18.2 | - 7 30.3 | -0.8666 | 0.5400 | -0.1046 | - 9 | -66 |
| ξ Cancri | 5.0 | 0.35 | 4.2 | 22 29.3 | 16 16 36.8 | + 9 14.7 | -0.8070 | 0.5305 | 0.1373 | - 4 | -68 |
| 79 Cancri | 6.3 | 0.35 | 4.1 | 22 26.4 | 17 5.6 | + 9 42.5 | -0.8181 | 0.5303 | 0.1385 | - 5 | -68 |
| B. A. C. 3138 | 6.3 | 0.37 | 3.8 | 21 44.0 | 18 41.8 | +11 15.7 | -0.2629 | 0.5290 | 0.1408 | +27 | -43 |
| B. A. C. 3206 | 6.3 | 0.42 | 3.7 | 20 15.6 | 17 0 10.6 | - 7 25.8 | +0.5672 | 0.5261 | 0.1500 | +81 | 0 |
| η Leonis | 3.3 | +0.63 | +1.2 | +17 17.7 | 21 39.0 | -10 36.7 | +0.2772 | 0.5152 | -0.1820 | +56 | -15 |
| 42 Leonis | 6.0 | 0.69 | +0.3 | 15 31.6 | 18 5 11.6 | - 3 17.5 | +0.8320 | 0.5115 | 0.1912 | +90 | +10 |
| ϵ Leonis | 5.7 | 0.72 | -0.2 | 14 41.9 | 10 37.9 | + 1 59.3 | +0.6932 | 0.5091 | 0.1974 | +90 | + 1 |
| k Leonis | 5.7 | 0.79 | 0.6 | 14 46.2 | 18 10.7 | + 9 19.2 | -0.9076 | 0.5059 | 0.2056 | - 8 | -75 |
| ω Virginis | 5.9 | 0.94 | 3.6 | 8 44.3 | 19 22 27.1 | -11 12.0 | -0.3893 | 0.4984 | 0.2289 | +22 | -62 |
| ν Virginis | 4.0 | +0.95 | -4.2 | + 7 8.4 | 20 2 32.3 | - 7 13.9 | +0.4410 | 0.4981 | -0.2314 | +68 | -17 |
| c Virginis | 5.5 | 1.04 | 5.6 | + 3 55.1 | 21 39.4 | +11 21.8 | -0.5111 | 0.4967 | 0.2397 | +15 | -73 |
| 48 Virginis | 6.7 | 1.10 | 7.6 | - 3 4.7 | 21 21 40.1 | +10 43.3 | +1.3730 | 0.4995 | 0.2430 | +87 | +48 |
| 65 Virginis | 6.1 | 1.13 | 7.9 | 4 21.4 | 22 8 15.0 | - 2 59.5 | +0.2062 | 0.5027 | 0.2424 | +53 | -31 |
| 66 Virginis | 6.0 | 1.13 | 8.0 | 4 35.7 | 8 54.5 | - 2 21.1 | +0.3078 | 0.5027 | 0.2412 | +58 | -26 |
| l^2 Virginis | 5.1 | +1.14 | -8.2 | - 5 41.7 | 12 55.7 | + 1 33.1 | +0.5429 | 0.5045 | -0.2405 | +74 | -13 |
| 80 Virginis | 6.1 | 1.14 | 8.1 | 4 50.5 | 14 50.2 | + 3 24.6 | -0.8492 | 0.5045 | 0.2397 | - 4 | -90 |
| 95 Virginis | 6.0 | 1.17 | 8.5 | 8 47.7 | 23 7 22.1 | - 4 31.8 | -0.4492 | 0.5118 | 0.2325 | +16 | -69 |
| κ Virginis | 4.2 | 1.18 | 8.5 | 9 46.1 | 10 34.8 | - 1 25.2 | -0.1338 | 0.5130 | 0.2302 | +32 | -49 |
| μ Libræ | 5.7 | 1.20 | 8.5 | 13 41.7 | 24 5 5.9 | - 7 26.8 | -0.0181 | 0.5235 | 0.2151 | +36 | -43 |
| ν^1 Libræ | 5.5 | +1.20 | -8.3 | -15 50.1 | 13 37.7 | + 0 48.7 | +0.4910 | 0.5290 | -0.2056 | +64 | -14 |
| 41 Libræ | 5.9 | 1.18 | 7.6 | 18 56.6 | 25 5 2.5 | - 8 15.9 | +0.8039 | 0.5388 | 0.1851 | +71 | + 3 |
| κ Libræ | 5.1 | 1.18 | 7.5 | 19 19.6 | 6 27.8 | - 6 53.2 | +0.9502 | 0.5398 | 0.1827 | +71 | +12 |
| λ Libræ | 5.1 | 1.18 | 7.2 | 19 50.5 | 11 44.9 | - 1 46.8 | +0.5559 | 0.5437 | 0.1744 | +63 | -12 |
| 47 Libræ | 6.4 | 1.17 | 7.2 | 19 3.7 | 12 31.8 | - 1 1.2 | -0.4138 | 0.5443 | 0.1730 | +10 | -68 |
| β^1 Scorpii | 2.9 | +1.16 | -7.2 | -19 30.5 | 17 18.1 | + 3 35.1 | -0.7411 | 0.5474 | -0.1647 | - 9 | -90 |
| β^2 Scorpii | 5.5 | 1.16 | 7.2 | 19 30.3 | 17 18.2 | + 3 35.2 | -0.7447 | 0.5474 | 0.1649 | - 9 | -90 |
| ω^1 Scorpii | 4.6 | 1.17 | 6.9 | 20 22.5 | 17 54.4 | + 4 10.2 | +0.0816 | 0.5482 | 0.1641 | +34 | -37 |
| ω^2 Scorpii | 4.6 | 1.17 | 6.8 | 20 34.5 | 18 10.4 | + 4 25.7 | +0.2500 | 0.5483 | 0.1635 | +44 | -28 |
| ω Ophiuchi | 4.7 | 1.13 | 6.3 | 21 14.0 | 26 5 13.4 | - 8 54.2 | -0.7420 | 0.5564 | 0.1426 | -11 | -90 |
| 22 Ophiuchi | 6.7 | +1.09 | -5.4 | -23 20.0 | 15 4.6 | + 0 36.1 | +0.1761 | 0.5635 | -0.1220 | +35 | -32 |
| 24 Ophiuchi | 6.0 | 1.08 | 5.4 | 22 58.7 | 15 55.3 | + 1 25.0 | -0.3023 | 0.5635 | 0.1198 | +10 | -60 |
| 39 Ophiuchi | 5.5 | 1.04 | 4.7 | 24 10.2 | 27 0 54.9 | +10 5.2 | -0.0333 | 0.5693 | 0.0995 | +22 | -44 |
| B. A. C. 5831 | 6.5 | 1.04 | 4.7 | 23 57.2 | 0 57.5 | +10 7.7 | -0.2667 | 0.5695 | 0.0995 | +10 | -58 |
| θ Ophiuchi | 3.3 | 1.02 | 4.4 | 24 53.6 | 2 34.9 | +11 41.6 | +0.5639 | 0.5698 | 0.0963 | +56 | -10 |
| b Ophiuchi | 4.4 | +1.01 | -4.5 | -24 4.6 | 4 25.4 | -10 32.0 | -0.4641 | 0.5714 | -0.0907 | - 2 | -73 |
| c^2 Ophiuchi | 5.2 | 1.00 | 4.3 | 23 52.8 | 6 32.0 | - 8 30.2 | -0.8564 | 0.5715 | 0.0854 | -24 | -90 |
| 63 Ophiuchi | 6.6 | 0.94 | 3.4 | 24 52.0 | 16 12.4 | + 0 48.4 | -0.5314 | 0.5764 | 0.0609 | - 8 | -79 |
| λ Sagittarii | 2.9 | 0.82 | 2.5 | 25 28.9 | 28 5 36.4 | -10 18.4 | -0.4609 | 0.5814 | 0.0247 | - 8 | -73 |
| B. A. C. 6369 | 6.2 | 0.74 | 2.3 | 25 7.2 | 12 22.2 | - 3 48.4 | -0.2412 | 0.5837 | 0.0662 | -36 | -90 |
| ϕ Sagittarii | 3.7 | +0.75 | -1.7 | -27 6.2 | 12 39.7 | - 3 31.5 | +1.1160 | 0.5840 | -0.0054 | +63 | +30 |
| σ Sagittarii | 2.3 | 0.70 | 1.8 | 26 26.0 | 16 30.7 | + 0 10.4 | +0.4197 | 0.5844 | +0.0055 | +39 | -18 |
| ψ Sagittarii | 5.4 | 0.61 | 1.7 | 25 26.7 | 0 36.9 | + 7 56.9 | -0.4664 | 0.5848 | 0.0282 | - 8 | -73 |
| χ^1 Sagittarii | 5.4 | 0.56 | 1.6 | 24 43.3 | 4 29.5 | +11 41.1 | -1.0800 | 0.5848 | 0.0392 | -44 | -90 |
| χ^2 Sagittarii | 6.3 | 0.56 | 1.7 | 24 37.6 | 4 32.0 | +11 43.4 | -1.1770 | 0.5848 | 0.0392 | -52 | -90 |
| λ^1 Sagittarii | 6.0 | +0.52 | -1.3 | -24 57.6 | 8 45.7 | - 8 12.8 | -0.6426 | 0.5854 | +0.0512 | -15 | -90 |
| λ^2 Sagittarii | 4.6 | 0.51 | 1.2 | 25 7.5 | 9 1.6 | - 7 57.6 | -0.4588 | 0.5854 | 0.0519 | - 6 | -73 |
| 17 Capricorni | 6.0 | 0.14 | 1.0 | 21 54.7 | 30 12 56.3 | - 5 8.1 | -1.2360 | 0.5793 | 0.1264 | -52 | -90 |
| χ Capricorni | 5.4 | 0.02 | 0.6 | 21 38.0 | 22 5.4 | + 3 40.1 | -0.2576 | 0.5757 | 0.1484 | +15 | -57 |
| 27 Capricorni | 6.5 | +0.01 | -0.9 | -20 59.7 | 22 30.0 | + 4 3.8 | -0.8459 | 0.5757 | +0.1494 | -17 | -90 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

| THE STAR'S | | | | AT CONJUNCTION IN R. A. | | | | | | | Limiting Parallels. | |
|--------------------------------|------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|---------|------|------------------------|--|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. | |
| | | $\Delta\alpha$ | $\Delta\delta$ | | | | | | | | | |
| ϕ Capricorni | 5.5 | -0.02 | -0.7 | -21° 6.4 | 1 1 0.5 | + 6 22.7 | -0.3385 | 0.5744 | +0.1567 | +11° | -63° | |
| 33 Capricorni | 5.7 | 0.06 | 0.5 | 21 19.0 | 4 32.2 | + 9 52.3 | +0.4231 | 0.5731 | 0.1631 | +53 | -19 | |
| 35 Capricorni | 6.2 | 0.08 | 0.3 | 21 40.1 | 5 48.9 | +11 6.1 | +0.9915 | 0.5727 | 0.1660 | +68 | +16 | |
| 37 Capricorni | 6.0 | 0.13 | 0.7 | 20 34.3 | 9 0.0 | - 9 49.9 | +0.4172 | 0.5706 | 0.1726 | +53 | -19 | |
| ϵ Capricorni | 4.7 | 0.13 | 0.9 | 19 57.4 | 9 56.2 | - 8 55.8 | -0.0439 | 0.5706 | 0.1747 | +28 | -44 | |
| κ Capricorni | 5.0 | -0.16 | -1.1 | -19 21.8 | 12 16.5 | - 6 40.7 | -0.2297 | 0.5702 | +0.1797 | +20 | -55 | |
| B. A. C. 7550 | 6.3 | 0.16 | 0.8 | 20 7.2 | 12 30.5 | - 6 27.2 | +0.5793 | 0.5702 | 0.1803 | +64 | -10 | |
| 20 Aquarii <i>mult.</i> | 6.5 | 0.26 | 1.5 | 17 29.4 | 20 39.5 | + 1 23.7 | -0.5479 | 0.5646 | 0.1956 | + 5 | -78 | |
| 56 Aquarii | 6.3 | 0.41 | 2.1 | 15 8.6 | 2 8 38.9 | -11 2.8 | -0.4379 | 0.5606 | 0.2166 | +13 | -69 | |
| τ^1 Aquarii <i>mult.</i> | 5.8 | 0.53 | 2.0 | 14 37.9 | 16 15.1 | - 3 42.9 | +0.7387 | 0.5572 | 0.2278 | +74 | - 2 | |
| τ^2 Aquarii | 4.1 | -0.54 | -2.1 | -14 10.2 | 17 5.0 | - 2 54.7 | +0.4639 | 0.5569 | +0.2292 | +64 | -17 | |
| 74 Aquarii | 6.0 | 0.55 | 2.8 | 12 11.9 | 18 48.1 | - 1 15.2 | -1.1220 | 0.5567 | 0.2315 | -27 | -90 | |
| ψ^1 Aquarii | 4.1 | 0.65 | 3.3 | 9 40.9 | 3 4 43.2 | + 8 19.2 | -1.2890 | 0.5533 | 0.2437 | -40 | -90 | |
| ψ^2 Aquarii | 4.2 | 0.66 | 3.3 | 9 46.8 | 5 38.3 | + 9 12.5 | -0.9631 | 0.5529 | 0.2447 | -13 | -90 | |
| ψ^3 Aquarii | 4.8 | 0.66 | 3.1 | 10 12.5 | 6 6.3 | + 9 39.4 | -0.4190 | 0.5516 | 0.2447 | +17 | -67 | |
| B. A. C. 8274 | 7.0 | -0.78 | -3.8 | - 6 59.3 | 19 25.3 | - 1 29.0 | -0.3000 | 0.5487 | +0.2565 | +25 | -59 | |
| 30 Piscium | 4.6 | 0.83 | 3.7 | 6 37.3 | 4 1 30.8 | + 4 24.0 | +0.9099 | 0.5479 | 0.2607 | +83 | + 7 | |
| 33 Piscium | 4.7 | 0.85 | 3.7 | 6 19.1 | 3 3.0 | + 5 53.1 | +1.0080 | 0.5478 | 0.2615 | +84 | +13 | |
| 14 Ceti | 6.0 | 0.98 | 4.7 | 1 6.4 | 16 49.5 | - 4 48.3 | -0.5616 | 0.5464 | 0.2664 | +12 | -77 | |
| 15 Ceti | 6.8 | 0.99 | 4.6 | - 1 6.4 | 17 59.3 | - 3 40.8 | -0.2517 | 0.5464 | 0.2665 | +28 | -56 | |
| 26 Ceti | 5.9 | -1.07 | -4.6 | + 0 46.9 | 5 5 45.4 | + 7 41.7 | +0.9984 | 0.5460 | +0.2662 | +90 | +13 | |
| 29 Ceti | 6.3 | 1.09 | 4.6 | 1 25.3 | 7 39.7 | + 9 32.1 | +0.8650 | 0.5460 | 0.2659 | +90 | + 5 | |
| 33 Ceti | 6.1 | 1.10 | 4.7 | 1 51.9 | 8 50.4 | +10 40.5 | +0.7350 | 0.5462 | 0.2656 | +90 | - 4 | |
| f Piscium | 5.1 | 1.12 | 4.1 | 3 2.3 | 12 8.6 | -10 8.1 | +0.4367 | 0.5463 | 0.2645 | +68 | -19 | |
| μ Piscium | 5.0 | 1.17 | -5.0 | 5 34.7 | 17 45.0 | - 4 43.0 | -0.6277 | 0.5480 | 0.2625 | + 9 | -81 | |
| NEW MOON. | | | | | | | | | | | | |
| κ^1 Tauri | 4.7 | -1.36 | 0.0 | +22 2.6 | 8 22 13.6 | - 2 56.3 | -0.5232 | 0.5703 | +0.1539 | +13 | -58 | |
| ν^1 Tauri | 4.7 | 1.37 | +0.1 | 22 33.9 | 22 36.4 | - 2 34.3 | -1.0035 | 0.5703 | 0.1523 | -17 | -67 | |
| τ Tauri | 4.5 | 1.34 | 0.8 | 22 44.9 | 9 5 16.0 | + 3 50.5 | -0.2310 | 0.5725 | 0.1371 | +29 | -39 | |
| MARS | | | | +23 12.9 | 10 36.0 | + 8 58.1 | -0.0190 | 0.5449 | +0.1208 | +41 | -27 | |
| 99 Tauri | 6.0 | -1.29 | +1.5 | 23 46.6 | 11 43.1 | +10 3.2 | -0.4620 | 0.5737 | 0.1214 | +15 | -52 | |
| 103 Tauri | 6.0 | 1.28 | 1.9 | 24 7.2 | 15 59.0 | - 9 50.6 | -0.3258 | 0.5737 | 0.1108 | +24 | -42 | |
| 118 Tauri | 5.7 | 1.22 | 2.9 | 25 3.7 | 10 0 43.0 | - 1 26.2 | -0.4372 | 0.5741 | 0.0885 | +17 | -47 | |
| 121 Tauri | 6.0 | 1.18 | 3.0 | 23 57.9 | 3 17.5 | + 1 2.5 | +0.9303 | 0.5744 | 0.0820 | +90 | +29 | |
| 125 Tauri | 6.0 | -1.18 | +3.4 | +25 50.2 | 5 1.3 | + 2 42.4 | -0.8935 | 0.5738 | +0.0774 | -11 | -64 | |
| 132 Tauri | 5.3 | 1.14 | 3.5 | 24 31.8 | 8 53.2 | + 6 25.6 | +0.7565 | 0.5738 | 0.0675 | +90 | +20 | |
| 139 Tauri | 5.3 | 1.11 | 4.0 | 25 56.4 | 12 34.3 | + 9 58.3 | -0.4965 | 0.5738 | 0.0578 | +14 | -48 | |
| ϵ Geminorum | 3.2 | 0.87 | 4.9 | 25 14.4 | 11 7 43.0 | + 4 24.1 | +0.8672 | 0.5698 | +0.0071 | +90 | +32 | |
| 37 Geminorum | 6.3 | 0.83 | 5.2 | 25 30.8 | 12 30.5 | + 9 1.0 | +0.5826 | 0.5672 | -0.0053 | +84 | +16 | |
| 39 Geminorum | 6.3 | -0.82 | +5.4 | +26 13.5 | 13 58.2 | +10 25.5 | -0.1868 | 0.5671 | -0.0089 | +31 | -25 | |
| 40 Geminorum | 6.3 | 0.81 | 5.4 | 26 3.9 | 14 15.0 | +10 41.6 | -0.0179 | 0.5670 | 0.0098 | +41 | -16 | |
| 47 Geminorum | 6.0 | 0.75 | 5.8 | 27 2.2 | 19 17.8 | - 8 26.7 | -1.1410 | 0.5654 | 0.0225 | -33 | -63 | |
| 52 Geminorum | 6.3 | 0.73 | 5.4 | 25 4.5 | 20 45.0 | - 7 2.6 | +0.9268 | 0.5644 | 0.0262 | +90 | +34 | |
| A Geminorum | 5.7 | 0.68 | 5.6 | 25 15.6 | 12 0 31.0 | - 3 24.8 | +0.6120 | 0.5626 | 0.0354 | +88 | +15 | |
| κ Geminor. <i>mult.</i> | 3.6 | -0.56 | +5.7 | +24 39.7 | 9 37.3 | + 5 21.9 | +0.8362 | 0.5581 | -0.0574 | +90 | +25 | |
| ω^1 Cancri | 6.0 | 0.47 | 6.2 | 25 41.5 | 16 52.0 | -11 38.7 | -0.7563 | 0.5536 | 0.0744 | - 2 | -64 | |
| ω^2 Cancri | 6.3 | 0.47 | 6.1 | 25 23.5 | 17 13.6 | -11 17.9 | -0.4584 | 0.5535 | 0.0752 | +16 | -47 | |
| λ Cancri | 5.7 | 0.35 | 6.0 | 24 22.0 | 13 1 41.2 | - 3 8.0 | -0.0634 | 0.5482 | 0.0938 | +38 | -26 | |
| ν^1 Cancri <i>mult.</i> | 6.0 | 0.32 | 6.2 | 24 53.6 | 4 27.7 | - 0 27.1 | -0.9057 | 0.5468 | 0.0998 | -11 | -65 | |
| ν^2 Cancri | 5.8 | -0.30 | +6.0 | +24 30.4 | 5 21.4 | + 0 24.7 | -0.5753 | 0.5462 | -0.1015 | +10 | -57 | |
| ω^3 Cancri | 6.0 | 0.29 | 6.1 | 24 27.0 | 6 41.2 | + 1 41.8 | -0.6496 | 0.5446 | 0.1042 | + 5 | -62 | |
| ν^4 Cancri | 5.7 | 0.28 | 6.1 | 24 27.4 | 7 22.2 | + 2 21.5 | -0.7278 | 0.5440 | 0.1056 | 0 | -66 | |
| ξ Cancri | 5.0 | 0.05 | 5.4 | 22 29.3 | 14 0 26.2 | - 5 8.2 | -0.6691 | 0.5334 | 0.1382 | + 5 | -66 | |
| 79 Cancri | 6.3 | 0.04 | 5.3 | 22 26.4 | 0 54.7 | - 4 40.7 | -0.6820 | 0.5334 | 0.1390 | + 4 | -67 | |
| B. A. C. 3138 | 6.3 | -0.03 | +5.0 | +21 44.0 | 2 29.7 | - 3 8.7 | -0.1298 | 0.5334 | -0.1417 | +35 | -35 | |
| B. A. C. 3206 | 6.3 | +0.03 | +4.4 | +23 15.6 | 7 54.7 | + 2 6.0 | +0.6979 | 0.5284 | -0.1509 | +90 | + 8 | |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

| MAY. | | | | | | | | | | | |
|------------------------------------|------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|---------|------------------------|-----|
| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | Limiting Parallels. | |
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. |
| | | $\Delta\alpha$ | $\Delta\delta$ | | | | | | | | |
| η Leonis | 3.3 | +0.28 | +2.8 | +17 17.7 | 13 5 12.5 | - 1 15.5 | +0.4045 | 0.5148 | -0.1822 | +65 | - 9 |
| 42 Leonis | 6.0 | 0.35 | 1.9 | 15 31.6 | 12 42.5 | + 6 1.5 | +0.9559 | 0.5115 | 0.1917 | +90 | +17 |
| ϵ Leonis | 5.7 | 0.40 | 1.5 | 14 41.9 | 18 8.0 | +11 17.1 | +0.8141 | 0.5084 | 0.1978 | +90 | + 8 |
| k Leonis | 5.7 | 0.47 | +1.3 | 11 46.2 | 16 1 39.7 | - 5 24.1 | -0.7861 | 0.5056 | 0.2061 | - 1 | -75 |
| ϵ Leonis <i>mult.</i> | 4.1 | 0.65 | -0.7 | 11 7.8 | 21 56.5 | - 9 41.8 | -1.1160 | 0.4978 | 0.2232 | -22 | -79 |
| ω Virginis | 5.9 | +0.72 | -1.9 | + 8 44.3 | 17 5 57.3 | - 1 54.3 | -0.2337 | 0.4961 | -0.2287 | +27 | -56 |
| ν Virginis | 4.0 | 0.75 | 2.6 | 7 8.4 | 10 2.8 | + 2 4.3 | +0.5434 | 0.4956 | 0.2311 | +76 | -12 |
| c Virginis | 5.5 | 0.90 | 4.2 | + 3 55.1 | 18 5 13.4 | - 3 16.5 | -0.4220 | 0.4950 | 0.2398 | +20 | -66 |
| 65 Virginis | 6.1 | 1.13 | 7.3 | - 4 21.4 | 19 15 54.5 | + 6 27.2 | +0.2641 | 0.5016 | 0.2422 | +57 | -28 |
| 66 Virginis | 6.0 | 1.13 | 7.4 | 4 35.7 | 16 33.9 | + 7 5.6 | +0.3636 | 0.5016 | 0.2415 | +62 | -23 |
| ι^1 Virginis | 5.1 | +1.16 | -7.7 | - 5 41.7 | 20 34.9 | +11 0.0 | +0.5946 | 0.5037 | -0.2409 | +78 | -11 |
| 80 Virginis | 6.1 | 1.20 | 7.4 | 4 50.5 | 22 30.4 | -11 8.0 | -0.7968 | 0.5037 | 0.2402 | - 2 | -90 |
| 95 Virginis | 6.0 | 1.27 | 8.4 | 8 47.7 | 20 15 0.3 | + 4 53.6 | -0.4115 | 0.5115 | 0.2332 | +18 | -66 |
| κ Virginis | 4.2 | 1.31 | 8.5 | 9 46.1 | 18 12.0 | + 7 59.1 | -0.0991 | 0.5120 | 0.2311 | +34 | -47 |
| μ Libræ | 5.7 | 1.42 | 8.9 | 13 41.8 | 21 12 37.3 | + 1 51.8 | 0.0000 | 0.5248 | 0.2163 | +37 | -42 |
| ν^1 Libræ | 5.5 | +1.47 | -8.9 | -15 50.1 | 21 4.3 | +10 2.9 | +0.4974 | 0.5310 | -0.2074 | +63 | -15 |
| 41 Libræ | 5.9 | 1.55 | 8.5 | 18 56.6 | 22 12 19.3 | + 0 48.2 | +0.7992 | 0.5437 | 0.1876 | +71 | + 2 |
| κ Libræ | 5.1 | 1.55 | 8.5 | 19 19.6 | 13 43.7 | + 2 9.8 | +0.9417 | 0.5438 | 0.1848 | +71 | +11 |
| λ Libræ | 5.1 | 1.57 | 8.2 | 19 50.5 | 18 56.4 | + 7 12.2 | +0.5459 | 0.5480 | 0.1765 | +62 | -12 |
| β^1 Scorpii | 2.9 | 1.59 | 7.8 | 19 30.5 | 23 0 24.9 | -11 30.6 | -0.7464 | 0.5520 | 0.1669 | - 9 | -90 |
| β^2 Scorpii | 5.5 | +1.59 | -7.8 | -19 30.3 | 0 24.9 | -11 30.6 | -0.7501 | 0.5520 | -0.1669 | - 9 | -90 |
| ω^1 Scorpii | 4.6 | 1.60 | 7.8 | 20 22.5 | 1 0.7 | -10 56.0 | +0.0704 | 0.5522 | 0.1659 | +33 | -38 |
| ω^2 Scorpii | 4.6 | 1.60 | 7.8 | 20 34.5 | 1 16.4 | -10 40.4 | +0.2358 | 0.5525 | 0.1655 | +43 | -29 |
| ω Ophiuchi | 4.6 | 1.62 | 7.1 | 21 14.0 | 12 9.1 | - 0 11.0 | -0.7561 | 0.5616 | 0.1445 | -12 | -90 |
| 24 Ophiuchi | 6.0 | 1.65 | 6.1 | 22 58.7 | 22 40.2 | + 9 57.3 | -0.3227 | 0.5686 | 0.1216 | + 9 | -62 |
| 39 Ophiuchi <i>mult.</i> | 5.5 | +1.66 | -5.3 | -24 10.2 | 24 7 30.5 | - 5 32.1 | -0.0608 | 0.5749 | -0.1007 | +20 | -46 |
| B. A. C. 5831 | 6.5 | 1.66 | 5.3 | 23 57.2 | 7 32.9 | - 5 29.7 | -0.2904 | 0.5749 | 0.1007 | + 9 | -60 |
| θ Ophiuchi | 3.3 | 1.67 | 5.1 | 24 53.6 | 9 8.5 | - 3 57.8 | +0.5321 | 0.5758 | 0.0969 | +53 | -12 |
| b Ophiuchi <i>var.</i> | 4.4 | 1.65 | 5.0 | 24 4.6 | 10 56.9 | - 2 13.3 | -0.4896 | 0.5768 | 0.0922 | - 3 | -75 |
| c Ophiuchi | 5.2 | 1.65 | 4.7 | 23 52.8 | 13 1.4 | - 0 13.8 | -0.8802 | 0.5782 | 0.0870 | -25 | -90 |
| 63 Ophiuchi | 6.6 | +1.64 | -3.6 | -24 52.0 | 22 31.2 | + 8 54.2 | -0.5589 | 0.5830 | -0.0619 | -10 | -82 |
| λ Sagittarii | 2.9 | 1.59 | 2.1 | 25 28.8 | 25 11 40.7 | - 2 27.1 | -0.4990 | 0.5874 | 0.0254 | -10 | -76 |
| B. A. C. 6369 | 6.2 | 1.54 | 1.6 | 25 7.1 | 18 19.7 | + 3 56.1 | -0.9777 | 0.5891 | 0.0064 | -39 | -90 |
| ϕ Sagittarii | 3.7 | 1.56 | 1.2 | 27 6.1 | 18 36.6 | + 4 12.3 | +1.0650 | 0.5894 | -0.0057 | +63 | +26 |
| σ Sagittarii | 2.3 | 1.53 | 1.0 | 26 25.9 | 22 23.9 | + 7 50.6 | +0.3746 | 0.5902 | +0.0052 | +36 | -20 |
| ψ Sagittarii | 5.4 | +1.46 | -0.4 | -25 26.6 | 26 6 21.9 | - 8 30.4 | -0.5103 | 0.5902 | +0.0283 | -10 | -77 |
| λ^1 Sagittarii <i>var.</i> | 6.0 | 1.39 | +0.4 | 24 57.5 | 14 24.8 | - 0 46.8 | -0.6871 | 0.5899 | 0.0517 | -17 | -90 |
| λ^2 Sagittarii | 4.6 | 1.38 | 0.4 | 25 7.4 | 14 40.5 | - 0 31.8 | -0.5042 | 0.5899 | 0.0521 | - 8 | -76 |
| γ Capricorni | 5.4 | 0.92 | 3.0 | 21 37.9 | 28 3 27.5 | +10 49.3 | -0.3102 | 0.5762 | 0.1485 | +12 | -61 |
| 27 Capricorni | 6.5 | 0.92 | 2.8 | 20 59.6 | 3 51.8 | +11 12.9 | -0.8982 | 0.5762 | 0.1495 | -21 | -90 |
| ϕ Capricorni | 5.5 | +0.89 | +3.0 | -21 6.3 | 6 22.2 | -10 22.4 | -0.4017 | 0.5750 | +0.1552 | + 8 | -67 |
| 33 Capricorni | 5.7 | 0.84 | 3.3 | 21 18.9 | 9 54.0 | - 6 58.6 | +0.3730 | 0.5723 | 0.1631 | +50 | -21 |
| 35 Capricorni | 6.2 | 0.83 | 3.5 | 21 40.0 | 11 10.9 | - 5 44.6 | +0.9423 | 0.5725 | 0.1660 | +68 | +12 |
| 37 Capricorni | 6.0 | 0.78 | 3.4 | 20 34.2 | 14 22.3 | - 2 40.2 | +0.3672 | 0.5701 | 0.1732 | +51 | -22 |
| ϵ Capricorni | 4.7 | 0.76 | 3.2 | 19 57.3 | 15 18.7 | - 1 46.0 | -0.0948 | 0.5698 | 0.1745 | +25 | -47 |
| κ Capricorni | 5.0 | +0.73 | +3.1 | -19 21.7 | 17 39.4 | + 0 29.5 | -0.2826 | 0.5688 | +0.1794 | +16 | -59 |
| B. A. C. 7350 | 6.3 | 0.73 | 3.4 | 20 7.1 | 17 53.5 | + 0 43.1 | +0.5279 | 0.5685 | 0.1797 | +61 | -13 |
| 29 Aquarii <i>mult.</i> | 6.5 | 0.62 | 3.0 | 17 29.3 | 29 2 5.3 | + 8 36.9 | -0.6013 | 0.5633 | 0.1951 | + 2 | -83 |
| 56 Aquarii | 6.3 | 0.45 | 2.8 | 15 8.5 | 14 11.6 | - 3 42.6 | -0.4898 | 0.5585 | 0.2156 | +10 | -73 |
| τ^1 Aquarii <i>mult.</i> | 5.8 | 0.35 | 3.1 | 14 37.8 | 21 54.0 | + 3 43.4 | +0.6947 | 0.5529 | 0.2263 | +76 | - 5 |
| τ^2 Aquarii | 4.1 | +0.33 | +2.6 | -14 10.1 | 22 44.5 | + 4 32.2 | +0.4290 | 0.5526 | +0.2274 | +60 | -20 |
| 74 Aquarii | 6.0 | 0.30 | 2.3 | 12 11.8 | 30 0 29.2 | + 6 13.3 | -1.1770 | 0.5517 | 0.2296 | -31 | -90 |
| ψ^2 Aquarii | 4.2 | 0.16 | 1.9 | 9 46.7 | 11 30.9 | - 7 7.7 | -1.0190 | 0.5470 | 0.2424 | -17 | -90 |
| ψ^1 Aquarii | 4.8 | +0.15 | 2.1 | 10 12.4 | 11 59.6 | - 6 40.1 | -0.4688 | 0.5468 | 0.2420 | +15 | -71 |
| B. A. C. 8274 | 7.0 | -0.03 | 1.4 | 6 59.2 | 31 1 35.6 | + 6 28.6 | -0.3423 | 0.5426 | 0.2540 | +23 | -62 |
| 30 Piscium | 4.6 | -0.09 | +1.4 | - 6 37.2 | 7 49.5 | -11 39.0 | +0.8786 | 0.5412 | +0.2577 | +83 | + 5 |
| 33 Piscium | 4.7 | -0.11 | +1.4 | - 6 19.0 | 9 24.2 | - 9 58.5 | +0.9797 | 0.5409 | +0.2584 | +84 | +11 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

| THE STAR'S | | | | AT CONJUNCTION IN R. A. | | | | | Limiting Parallels. | |
|-------------|------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|------------------------|---------|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. S. |
| | | $\Delta\alpha$ | $\Delta\delta$ | | d h m | h m | | | | |
| B. A. C. 17 | 6.0 | -0.14 | +1.3 | - 5 51.2 | 31 11 43.4 | - 7 43.8 | +1.1130 | 0.5403 | +0.2595 | +54 +21 |
| 14 Ceti | 6.0 | -0.28 | +0.1 | - 1 6.3 | 23 32.2 | + 3 41.9 | -0.6036 | 0.5384 | +0.2627 | +10 -81 |

JUNE.

| | | | | | | | | | | |
|-------------------------|-----|-------|------|----------|------------|----------|---------|--------|---------|---------|
| 15 Ceti | 6.8 | -0.29 | +0.1 | - 1 6.3 | 1 0 44.0 | + 4 51.4 | -0.2901 | 0.5383 | +0.2629 | +27 -58 |
| 26 Ceti | 5.9 | 0.42 | 0.0 | + 0 47.0 | 12 49.5 | - 7 26.8 | +0.9797 | 0.5375 | 0.2624 | +90 +11 |
| 29 Ceti | 6.3 | 0.44 | -0.1 | 1 25.4 | 14 47.0 | - 5 33.4 | +0.8449 | 0.5375 | 0.2619 | +90 + 4 |
| 33 Ceti | 6.1 | 0.45 | 0.2 | 1 52.0 | 15 59.7 | - 4 22.9 | +0.7145 | 0.5384 | 0.2619 | +90 - 5 |
| 35 Ceti | 6.3 | 0.46 | 0.2 | 1 53.7 | 16 55.3 | - 3 29.1 | +0.9307 | 0.5387 | 0.2618 | +90 + 9 |
| f Piscium | 5.1 | -0.49 | -0.4 | + 3 2.4 | 19 23.4 | - 1 5.9 | +0.4138 | 0.5389 | +0.2611 | +66 -20 |
| μ Piscium | 5.0 | 0.55 | 1.0 | 5 34.8 | 9 1 9.3 | + 4 28.8 | -0.6620 | 0.5394 | 0.2586 | + 7 -83 |
| ξ Arietis | 5.3 | 0.76 | 0.9 | 10 7.0 | 2 25.0 | + 4 53.9 | +1.0590 | 0.5459 | 0.2399 | +90 +20 |
| 31 Arietis | 5.7 | 0.82 | 1.1 | 11 58.5 | 7 45.3 | +10 3.6 | +0.4336 | 0.5483 | 0.2342 | +68 -16 |
| σ Arietis | 5.5 | 0.88 | -1.3 | 14 37.9 | 14 26.4 | - 7 29.0 | -0.7410 | 0.5512 | 0.2257 | + 2 -74 |
| VENUS | | | | +14 54.3 | 3 18 6.2 | - 3 57.0 | -0.2065 | 0.5043 | +0.2051 | +31 -48 |
| NEW MOON. | | | | | | | | | | |
| ϵ Geminorum | 3.2 | -0.94 | +4.5 | 25 14.3 | 7 16 45.5 | - 8 45.4 | +0.8582 | 0.5732 | +0.0071 | +90 +32 |
| 37 Geminorum | 6.3 | 0.91 | 4.7 | 25 30.7 | 21 30.7 | - 4 10.8 | +0.5826 | 0.5716 | -0.0053 | +84 +16 |
| 39 Geminorum | 6.3 | -0.91 | +4.9 | +26 13.4 | -22 58.0 | - 2 47.0 | -0.1865 | 0.5708 | -0.0091 | +31 -25 |
| 40 Geminorum | 6.3 | 0.90 | 4.9 | 26 3.8 | 23 14.6 | - 2 30.9 | -0.0178 | 0.5706 | 0.0099 | +41 -16 |
| 47 Geminorum | 6.0 | 0.87 | 5.3 | 27 2.2 | 8 4 15.0 | + 2 18.3 | -1.1410 | 0.5694 | 0.0228 | -33 -63 |
| 52 Geminorum | 6.3 | 0.85 | 5.1 | 25 4.5 | 5 41.3 | + 3 41.6 | +0.9215 | 0.5685 | 0.0264 | +90 +34 |
| A Geminorum | 5.7 | 0.82 | 5.3 | 25 15.6 | 9 25.1 | + 7 17.3 | +0.6089 | 0.5666 | 0.0359 | +87 +15 |
| c Geminorum | 6.0 | -0.74 | +5.8 | +26 2.7 | 18 15.7 | - 8 11.4 | -0.6488 | 0.5622 | -0.0577 | + 5 -59 |
| κ Geminor mult. | 3.6 | 0.73 | 5.5 | 24 39.7 | 18 26.0 | - 8 1.4 | -0.8297 | 0.5618 | 0.0578 | +90 +25 |
| ω^1 Cancri | 6.0 | 0.67 | 6.0 | 25 41.5 | 9 1 36.0 | - 1 6.7 | -0.7570 | 0.5577 | 0.0749 | - 2 -64 |
| ω^2 Cancri | 6.3 | 0.66 | 6.0 | 25 23.5 | 1 57.5 | - 0 46.1 | -0.4604 | 0.5573 | 0.0758 | +16 -48 |
| λ Cancri | 5.7 | 0.57 | 6.0 | 24 22.0 | 10 19.3 | + 7 18.2 | -0.0668 | 0.5525 | 0.0948 | +38 -27 |
| ν^1 Cancri mult. | 6.0 | -0.54 | +6.2 | +24 53.6 | 13 4.0 | + 9 57.1 | -0.9078 | 0.5511 | -0.1006 | -12 -65 |
| ν^2 Cancri | 5.8 | 0.53 | 6.1 | 24 30.4 | 13 57.1 | +10 48.5 | -0.5768 | 0.5502 | 0.1026 | + 9 -57 |
| ν^3 Cancri | 6.0 | 0.52 | 6.1 | 24 27.0 | 15 16.0 | -11 55.3 | -0.6528 | 0.5493 | 0.1051 | + 5 -62 |
| ν^4 Cancri | 5.7 | 0.51 | 6.2 | 24 27.4 | 15 56.4 | -11 16.3 | -0.7304 | 0.5484 | 0.1065 | 0 -66 |
| ξ Cancri | 5.0 | 0.31 | 5.8 | 22 29.3 | 10 8 49.4 | + 5 2.8 | -0.6740 | 0.5374 | 0.1393 | + 4 -66 |
| 79 Cancri | 6.3 | -0.31 | +5.7 | +22 26.4 | 9 17.6 | + 5 30.1 | -0.6868 | 0.5374 | -0.1403 | + 4 -67 |
| B. A. C. 3138 | 6.3 | 0.29 | 5.5 | 21 44.0 | 10 51.5 | + 7 0.9 | -0.1367 | 0.5357 | 0.1428 | +34 -35 |
| B. A. C. 3206 | 6.3 | -0.23 | 5.1 | 20 15.6 | 16 13.5 | -11 47.4 | +0.6844 | 0.5319 | 0.1521 | +90 + 7 |
| η Leonis | 3.3 | +0.01 | 3.9 | 17 17.7 | 11 13 20.5 | + 8 40.3 | +0.3890 | 0.5177 | 0.1834 | +66 -13 |
| 42 Leonis | 6.0 | 0.08 | 3.5 | 15 31.6 | 20 47.9 | - 8 5.7 | +0.9376 | 0.5133 | 0.1928 | +90 +16 |
| i Leonis | 5.7 | +0.13 | +2.8 | +14 41.9 | 19 2 11.4 | - 2 51.7 | +0.7960 | 0.5101 | -0.1986 | +90 + 7 |
| k Leonis | 5.7 | 0.20 | 2.5 | 14 46.3 | 9 41.4 | + 4 25.3 | -0.8048 | 0.5063 | 0.2065 | - 2 -75 |
| l Leonis mult. | 4.1 | 0.39 | +0.8 | 11 7.8 | 13 5 56.4 | + 0 6.0 | -1.1420 | 0.4981 | 0.2236 | -24 -79 |
| ω Virginis | 5.9 | 0.46 | -0.2 | 8 44.3 | 13 57.8 | + 7 54.2 | -0.3063 | 0.4961 | 0.2287 | +26 -57 |
| ξ Virginis | 5.3 | 0.50 | 0.3 | 8 51.8 | 17 44.2 | +11 34.3 | -1.3110 | 0.4941 | 0.2304 | -40 -81 |
| ρ Virginis | 4.0 | +0.49 | -0.9 | + 7 8.4 | 18 3.9 | +11 53.4 | +0.5176 | 0.4943 | -0.2306 | +74 -13 |
| c Virginis | 5.5 | 0.66 | 2.5 | 3 55.2 | 14 13 19.4 | + 6 37.6 | -0.4504 | 0.4922 | 0.2383 | +18 -68 |
| B. A. C. 4254 | 6.1 | 0.75 | 3.3 | + 2 27.3 | 23 23.5 | - 7 34.7 | -1.2460 | 0.4928 | 0.2406 | -32 -88 |
| 48 Virginis | 6.7 | 0.87 | 5.5 | - 3 4.6 | 15 13 34.5 | + 6 13.2 | +1.4120 | 0.4948 | 0.2414 | +87 +59 |
| 65 Virginis | 6.1 | 0.97 | 6.0 | 4 21.4 | 16 0 15.2 | - 7 23.8 | +0.2354 | 0.4984 | 0.2405 | +55 -30 |
| 66 Virginis | 6.0 | +0.98 | -6.1 | - 4 35.7 | 0 55.1 | - 6 45.0 | +0.3394 | 0.4989 | -0.2405 | +61 -24 |
| l ² Virginis | 5.1 | 1.02 | 6.5 | 5 41.7 | 4 58.2 | - 2 48.8 | +0.5692 | 0.4997 | 0.2391 | +76 -12 |
| 80 Virginis | 6.1 | 1.04 | 6.2 | 4 50.5 | 6 53.9 | - 0 56.4 | -0.8235 | 0.5007 | 0.2388 | - 3 -90 |
| 88 Virginis | 6.8 | 1.10 | 6.7 | 6 17.7 | 13 46.7 | + 5 44.7 | -0.8712 | 0.5039 | 0.2365 | - 7 -90 |
| B. A. C. 4647 mult. | 6.4 | 1.13 | 7.1 | 7 31.4 | 17 19.9 | + 9 12.0 | -0.3732 | 0.5054 | 0.2348 | +21 -64 |
| W. xiii, 825 | 6.8 | +1.14 | -7.5 | - 9 1.6 | 17 44.8 | + 9 36.1 | +1.1650 | 0.5057 | -0.2348 | +81 +25 |
| 94 Virginis | 6.8 | +1.19 | -7.3 | - 8 22.4 | 23 18.2 | - 9 0.2 | -0.8408 | 0.5087 | -0.2320 | - 5 -90 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | | | Limiting Parallels | |
|----------------------|------|------------------------|----------------|-------------------------|--------------------------|-----------------|---------|--------|---------|-----|-----|-----------------------|--|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. | | |
| | | $\Delta\alpha$ | $\Delta\delta$ | | | | | | | | | | |
| 95 Virginia | 6.0 | +1.20 | -7.4 | - 8 47.7 | 16 23 31.6 | - 8 47.1 | -0.4358 | 0.5092 | -0.2318 | +17 | -68 | | |
| 96 Virginia | 6.9 | 1.21 | 7.7 | 9 49.2 | 17 0 42.8 | - 7 38.1 | +0.4025 | 0.5092 | 0.2310 | +63 | -21 | | |
| κ Virginia | 4.2 | 1.25 | 7.7 | 9 46.1 | 2 44.5 | - 5 40.0 | -0.1227 | 0.5107 | 0.2300 | +33 | -40 | | |
| 2 Libræ | 6.5 | 1.28 | 8.0 | 11 13.1 | 8 10.9 | - 0 23.2 | +0.2032 | 0.5131 | 0.2261 | +50 | -31 | | |
| μ Libræ | 5.7 | 1.42 | 8.5 | 13 41.7 | 21 15.4 | -11 42.3 | -0.0197 | 0.5225 | 0.2154 | +36 | -43 | | |
| ν Libræ | 5.5 | +1.51 | -8.8 | -15 50.1 | 18 5 44.2 | - 3 29.3 | +0.4804 | 0.5293 | -0.2063 | +63 | -16 | | |
| ν Libræ | 6.9 | 1.51 | 8.9 | 16 3.8 | 5 48.9 | - 3 24.5 | +0.7063 | 0.5293 | 0.2061 | +74 | - 4 | | |
| 28 Libræ | 6.0 | 1.58 | 9.0 | 17 45.9 | 12 32.9 | + 3 6.5 | +1.1580 | 0.5347 | 0.1979 | +72 | +28 | | |
| ζ Libræ | 6.0 | 1.61 | 8.5 | 16 20.3 | 16 3.3 | + 6 30.0 | -1.0460 | 0.5375 | 0.1933 | -24 | -90 | | |
| ζ Libræ | 7.0 | 1.62 | 8.6 | 17 4.0 | 16 40.1 | + 7 5.6 | -0.3911 | 0.5384 | 0.1924 | +14 | -66 | | |
| 41 Libræ | 5.9 | +1.66 | -8.8 | -18 56.6 | 20 58.8 | +11 15.7 | +0.7843 | 0.5420 | -0.1864 | +71 | + 1 | | |
| κ Libræ | 5.1 | 1.68 | 8.8 | 19 19.6 | 22 22.9 | -11 23.0 | +0.9292 | 0.5438 | 0.1845 | +71 | +11 | | |
| λ Libræ | 5.1 | 1.73 | 8.5 | 19 50.5 | 19 34.9 | - 6 21.5 | +0.5352 | 0.5483 | 0.1761 | +62 | -13 | | |
| 47 Libræ | 6.4 | 1.73 | 8.3 | 19 3.7 | 4 21.3 | - 5 36.8 | -0.4243 | 0.5487 | 0.1749 | +10 | -68 | | |
| β Scorpii | 2.9 | 1.77 | 8.1 | 19 30.5 | 9 2.0 | - 1 5.2 | -0.7538 | 0.5521 | 0.1678 | - 9 | -90 | | |
| β Scorpii | 5.5 | +1.77 | -8.1 | -19 30.3 | 9 2.1 | - 1 5.1 | -0.7583 | 0.5521 | -0.1678 | - 9 | -90 | | |
| ω Scorpii | 4.6 | 1.78 | 8.2 | 20 22.5 | 9 37.6 | - 0 31.2 | +0.0632 | 0.5535 | 0.1656 | +33 | -38 | | |
| ω Scorpii | 4.6 | 1.79 | 8.2 | 20 34.5 | 9 53.2 | - 0 16.2 | +0.2298 | 0.5536 | 0.1653 | +42 | -29 | | |
| ω Ophiuchi | 4.7 | 1.87 | 7.4 | 21 14.0 | 20 41.6 | +10 9.3 | -0.7537 | 0.5635 | 0.1445 | -12 | -90 | | |
| 39 Ophiuchi mult. | 5.5 | 2.04 | 5.9 | 24 10.2 | 20 15 50.6 | + 4 35.7 | -0.0535 | 0.5785 | 0.1008 | +21 | -45 | | |
| θ Ophiuchi | 3.3 | +2.06 | -5.7 | -24 53.6 | 17 27.3 | + 6 8.7 | +0.5370 | 0.5798 | -0.0969 | +54 | -12 | | |
| b Ophiuchi var. | 4.4 | 2.05 | 5.4 | 24 4.6 | 19 14.4 | + 7 51.7 | -0.4758 | 0.5809 | 0.0923 | - 3 | -74 | | |
| c Ophiuchi | 5.2 | 2.06 | 5.2 | 23 52.8 | 21 16.8 | + 9 49.4 | -0.8638 | 0.5827 | 0.0873 | -24 | -90 | | |
| λ Sagittarii | 2.9 | 2.15 | 2.3 | 25 28.8 | 21 19 32.6 | + 7 12.5 | -0.4726 | 0.5944 | 0.0252 | - 9 | -74 | | |
| ϕ Sagittarii | 3.7 | 2.17 | 1.3 | 27 6.1 | 22 2 19.9 | -10 16.6 | +1.0900 | 0.5060 | -0.0053 | +63 | +27 | | |
| σ Sagittarii | 2.3 | +2.15 | -0.6 | -26 25.9 | 6 2.8 | - 6 43.0 | +0.3979 | 0.5976 | +0.0059 | +37 | -19 | | |
| ψ Sagittarii | 5.4 | 2.12 | +0.3 | 25 26.6 | 13 49.9 | + 0 45.3 | -0.4712 | 0.5980 | 0.0294 | - 9 | -74 | | |
| h Sagittarii var. | 6.0 | 2.10 | 1.4 | 24 57.5 | 21 41.9 | + 8 17.9 | -0.6430 | 0.5980 | 0.0526 | -15 | -90 | | |
| h Sagittarii | 4.6 | 2.10 | 1.4 | 25 7.4 | 21 56.9 | + 8 32.5 | -0.4603 | 0.5980 | 0.0534 | - 6 | -73 | | |
| χ Capricorni | 5.4 | 1.77 | 5.8 | 21 37.8 | 24 9 52.8 | - 4 58.0 | -0.2497 | 0.5827 | 0.1508 | +15 | -57 | | |
| 27 Capricorni | 6.5 | +1.76 | +5.7 | -20 59.5 | 10 16.8 | - 4 35.0 | -0.8310 | 0.5826 | +0.1516 | -16 | -90 | | |
| ϕ Capricorni | 5.5 | 1.73 | 6.0 | 21 6.2 | 12 43.9 | - 2 13.5 | -0.3406 | 0.5816 | 0.1575 | +11 | -63 | | |
| 33 Capricorni | 5.7 | 1.70 | 6.5 | 21 18.8 | 16 11.3 | + 1 5.8 | +0.4306 | 0.5793 | 0.1654 | +53 | -18 | | |
| 35 Capricorni | 6.2 | 1.69 | 6.6 | 21 39.9 | 17 26.5 | + 2 18.1 | +0.9919 | 0.5781 | 0.1683 | +68 | +16 | | |
| 37 Capricorni | 6.0 | 1.64 | 6.7 | 20 34.1 | 20 33.9 | + 5 18.5 | +0.4239 | 0.5765 | 0.1750 | +54 | -19 | | |
| e Capricorni | 4.7 | +1.62 | +6.6 | -19 57.2 | 21 28.9 | + 6 11.5 | -0.0318 | 0.5758 | +0.1770 | +29 | -44 | | |
| κ Capricorni | 5.0 | 1.59 | 6.7 | 19 21.6 | 23 46.9 | + 8 24.2 | -0.2145 | 0.5745 | 0.1808 | +20 | -54 | | |
| B. A. C. 7550 | 6.3 | 1.60 | 6.9 | 20 7.0 | 25 0 0.9 | + 8 37.7 | +0.5882 | 0.5745 | 0.1822 | +65 | -10 | | |
| 29 Aquarii mult. | 6.5 | 1.48 | 6.9 | 17 29.2 | 8 3.3 | - 7 38.0 | -0.5278 | 0.5693 | 0.1977 | + 6 | -76 | | |
| 56 Aquarii | 6.3 | 1.33 | 7.2 | 15 8.4 | 19 57.8 | + 3 50.5 | -0.4127 | 0.5626 | 0.2178 | +14 | -67 | | |
| τ Aquarii mult. | 5.8 | +1.23 | +7.6 | -14 37.7 | 26 3 33.8 | +11 10.2 | +0.7684 | 0.5572 | +0.2284 | +71 | 0 | | |
| τ Aquarii | 4.1 | 1.22 | 7.5 | 14 10.0 | 4 23.8 | +11 58.4 | +0.4950 | 0.5563 | 0.2294 | +65 | -16 | | |
| 74 Aquarii | 6.0 | 1.18 | 7.0 | 12 11.7 | 6 6.8 | -10 21.8 | -1.0940 | 0.5554 | 0.2315 | -24 | -90 | | |
| ψ Aquarii | 4.1 | 1.05 | 6.9 | 9 40.7 | 16 6.5 | - 0 42.9 | -1.2530 | 0.5493 | 0.2425 | -37 | -90 | | |
| ψ Aquarii | 4.2 | 1.04 | 7.0 | 9 46.6 | 17 2.1 | + 0 10.8 | -0.9311 | 0.5490 | 0.2433 | -11 | -90 | | |
| ψ Aquarii | 4.8 | +1.04 | +7.1 | -10 12.5 | 17 30.6 | + 0 38.3 | -0.3849 | 0.5490 | +0.2440 | +19 | -65 | | |
| B. A. C. 8274 | 7.0 | 0.85 | 6.8 | 6 59.1 | 27 7 2.2 | -10 17.5 | -0.2575 | 0.5432 | 0.2546 | +27 | -56 | | |
| 30 Piscium | 4.6 | 0.78 | 7.0 | 6 37.1 | 13 15.4 | - 4 16.8 | +0.9645 | 0.5405 | 0.2575 | +83 | +10 | | |
| 33 Piscium | 4.7 | 0.76 | 6.9 | 6 18.9 | 14 49.9 | - 2 45.4 | +1.0640 | 0.5399 | 0.2580 | +84 | +17 | | |
| B. A. C. 17 | 6.0 | 0.73 | 6.9 | 5 51.1 | 17 9.3 | - 0 30.5 | +1.1980 | 0.5398 | 0.2593 | +84 | +28 | | |
| 14 Ceti | 6.0 | +0.57 | +5.7 | - 1 6.2 | 28 5 0.2 | +10 57.0 | -0.5186 | 0.5363 | +0.2618 | +15 | -74 | | |
| 15 Ceti | 6.8 | 0.55 | 5.6 | - 1 6.2 | 6 12.4 | -11 53.1 | -0.2027 | 0.5360 | 0.2618 | +31 | -53 | | |
| 26 Ceti | 5.9 | 0.41 | 5.5 | + 0 47.1 | 18 23.3 | - 0 5.9 | +1.0720 | 0.5352 | 0.2610 | +90 | +18 | | |
| 29 Ceti | 6.3 | 0.38 | 5.3 | 1 25.5 | 20 21.9 | + 1 48.9 | +0.9356 | 0.5351 | 0.2605 | +90 | + 9 | | |
| 33 Ceti | 6.1 | 0.37 | 5.2 | 1 52.1 | 21 35.3 | + 2 59.8 | +0.8033 | 0.5350 | 0.2602 | +90 | + 1 | | |
| 35 Ceti | 6.3 | +0.36 | +5.2 | + 1 53.8 | 22 31.4 | + 3 54.2 | +1.0170 | 0.5348 | +0.2597 | +90 | +14 | | |
| f Piscium | 5.1 | +0.33 | +4.9 | + 3 2.5 | 29 1 1.2 | + 6 19.1 | +0.5008 | 0.5354 | +0.2593 | +72 | -16 | | |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

| THE STAR'S | | | | AT CONJUNCTION IN R. A. | | | | | Limiting Parallels. | |
|------------------|------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|------------------------|---------|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. S. |
| | | $\Delta\alpha$ | $\Delta\delta$ | | d h m | h m | | | | N. S. |
| μ Piscium | 5.0 | +0.26 | +4.2 | + 5 34.9 | 29 6 51.3 | +11 57.9 | -0.5822 | 0.5354 | +0.2564 | +12 -77 |
| ξ Arietis | 5.3 | -0.01 | 3.5 | 10 7.1 | 30 8 31.0 | -11 12.7 | +1.1400 | 0.5399 | 0.2352 | +90 +27 |
| 31 Arietis | 5.7 | 0.08 | 3.0 | 11 58.6 | 13 57.4 | - 5 57.1 | +0.5060 | 0.5426 | 0.2310 | +74 -12 |
| σ Arietis | 5.5 | -0.15 | +2.4 | +14 38.0 | 20 46.3 | + 0 38.1 | -0.6837 | 0.5450 | +0.2226 | + 5 -75 |

JULY.

| | | | | | | | | | | |
|------------------|-----|-------|------|----------|-----------|----------|---------|--------|---------|---------|
| 13 Tauri | 5.7 | -0.36 | +1.8 | +19 21.0 | 1 19 35.8 | - 1 19.1 | -0.8792 | 0.5544 | +0.1873 | - 7 -71 |
| 14 Tauri | 6.3 | 0.36 | 1.9 | 19 19.2 | 20 14.6 | - 0 41.7 | -0.7180 | 0.5546 | 0.1860 | + 2 -71 |
| B. A. C. 1242 | 6.3 | 0.42 | 2.1 | 19 53.6 | 2 3 51.8 | + 6 39.4 | +0.0486 | 0.5581 | 0.1719 | +45 -28 |
| ω^3 Tauri | 5.7 | -0.47 | +2.2 | +20 18.6 | 10 53.3 | -10 34.0 | +0.7722 | 0.5609 | +0.1578 | +90 +11 |
| 51 Tauri | 6.0 | 0.48 | 2.1 | 21 18.8 | 11 20.8 | -10 7.3 | -0.3017 | 0.5609 | 0.1567 | +31 -40 |
| 53 Tauri | 6.0 | 0.48 | 2.2 | 20 52.7 | 11 48.7 | - 9 40.4 | +0.3235 | 0.5609 | 0.1557 | +61 -12 |
| 56 Tauri | 6.0 | 0.48 | 2.1 | 21 30.6 | 11 52.6 | - 9 36.7 | -0.3235 | 0.5609 | 0.1557 | +24 -46 |
| κ^1 Tauri | 4.7 | 0.50 | 2.1 | 22 2.6 | 14 21.0 | - 7 13.6 | -0.5017 | 0.5624 | 0.1505 | +14 -57 |
| κ^2 Tauri | 6.3 | -0.50 | +2.0 | +21 57.0 | 14 22.3 | - 7 12.3 | -0.4024 | 0.5624 | +0.1505 | +20 -51 |
| ν^1 Tauri | 4.7 | 0.50 | 2.0 | 22 33.9 | 14 44.6 | - 6 50.8 | -0.9895 | 0.5627 | 0.1496 | -16 -67 |
| ν^2 Tauri | 6.0 | 0.51 | 2.0 | 22 45.0 | 15 10.2 | - 6 26.1 | -1.1180 | 0.5627 | 0.1486 | -27 -67 |
| B. A. C. 1373 | 6.0 | 0.50 | 2.0 | 21 22.4 | 15 30.2 | - 6 6.8 | +0.3693 | 0.5641 | 0.1479 | +65 -10 |
| τ Tauri | 4.5 | 0.55 | 2.3 | 22 44.9 | 21 35.1 | - 0 15.1 | -0.2094 | 0.5649 | 0.1346 | +30 -38 |
| 99 Tauri | 6.0 | -0.59 | +2.4 | +23 46.6 | 3 4 11.5 | + 6 6.9 | -0.4519 | 0.5681 | +0.1192 | +17 -50 |
| 103 Tauri | 6.0 | 0.60 | 2.6 | 24 7.2 | 8 32.6 | +10 18.4 | -0.3152 | 0.5681 | 0.1088 | +24 -41 |
| 118 Tauri | 5.7 | 0.64 | 2.8 | 25 3.7 | 17 26.2 | - 5 7.6 | -0.7874 | 0.5720 | 0.0870 | - 4 -65 |
| 121 Tauri | 6.0 | 0.64 | 3.0 | 23 57.9 | 20 2.0 | - 2 36.7 | +0.9404 | 0.5703 | +0.0803 | +90 +30 |

NEW MOON.

| | | | | | | | | | | |
|-----------------------------|-----|-------|------|----------|------------|----------|---------|--------|---------|---------|
| ξ Cancri | 5.0 | -0.39 | +5.4 | +22 29.3 | 7 16 52.3 | - 9 6.5 | -0.7669 | 0.5389 | -0.1408 | - 1 -68 |
| 79 Cancri | 6.3 | 0.38 | 5.4 | 22 26.4 | 17 20.4 | - 8 39.4 | -0.7796 | 0.5388 | 0.1416 | - 2 -68 |
| B. A. C. 3138 | 6.3 | 0.37 | 5.2 | 21 44.0 | 18 54.2 | - 7 8.6 | -0.2314 | 0.5374 | 0.1444 | +29 -41 |
| B. A. C. 3206 | 6.3 | 0.34 | 4.9 | 20 15.6 | 8 0 15.0 | - 1 58.1 | +0.5839 | 0.5337 | 0.1539 | +82 + 1 |
| η Leonis | 3.3 | -0.16 | +4.0 | +17 17.6 | 21 18.0 | - 5 34.5 | +0.2698 | 0.5196 | -0.1846 | -58 -20 |
| 42 Leonis | 6.0 | 0.11 | 3.5 | 15 31.5 | 9 4 44.1 | + 1 38.3 | +0.8108 | 0.5152 | 0.1941 | +90 + 8 |
| ι Leonis | 5.7 | 0.07 | 3.2 | 14 41.8 | 10 6.8 | + 6 51.4 | +0.6619 | 0.5115 | 0.2004 | +88 - 1 |
| k Leonis | 5.7 | -0.01 | 3.0 | 14 46.2 | 17 35.7 | - 9 52.6 | -0.9450 | 0.5076 | 0.2078 | -10 -75 |
| ι Leonis <i>mult.</i> | 4.1 | +0.15 | 1.7 | 11 7.8 | 10 13 49.6 | + 9 47.0 | -1.2990 | 0.4981 | 0.2240 | -39 -79 |
| ω Virginis | 5.9 | +0.20 | +0.8 | + 8 44.3 | 21 51.7 | - 6 24.2 | -0.4706 | 0.4955 | -0.2289 | +17 -68 |
| ν Virginis | 4.0 | 0.24 | +0.3 | 7 9.4 | 11 1 58.3 | - 2 24.8 | +0.3562 | 0.4941 | 0.2310 | +62 -22 |
| c Virginis | 5.5 | 0.40 | -1.1 | + 3 55.2 | 21 18.6 | - 7 35.4 | -0.6256 | 0.4913 | 0.2382 | + 9 -82 |
| 46 Virginis | 6.1 | 0.60 | 3.8 | - 2 46.9 | 12 19 54.2 | - 9 36.3 | +1.3620 | 0.4920 | 0.2405 | +87 +46 |
| 48 Virginis | 6.7 | 0.62 | 3.9 | 3 4.6 | 21 45.2 | - 7 48.3 | +1.2410 | 0.4926 | 0.2403 | +87 +31 |
| 65 Virginis | 6.1 | +0.73 | -4.5 | - 4 21.4 | 13 8 32.8 | + 2 41.6 | +0.0623 | 0.4948 | -0.2385 | +45 -39 |
| 66 Virginis | 6.0 | 0.74 | 4.6 | 4 35.7 | 9 13.1 | + 3 20.8 | +0.1630 | 0.4951 | 0.2385 | +51 -33 |
| ι^2 Virginis | 5.1 | 0.78 | 5.0 | 5 41.7 | 13 18.9 | + 7 19.9 | +0.3968 | 0.4961 | 0.2373 | +64 -21 |
| 80 Virginis | 6.1 | 0.80 | 4.7 | 4 50.5 | 15 16.1 | + 9 13.9 | -1.0040 | 0.4971 | 0.2368 | -14 -90 |
| 88 Virginis | 6.8 | 0.89 | 5.3 | 6 17.7 | 22 14.0 | - 7 59.8 | -1.0500 | 0.5000 | 0.2343 | -18 -90 |
| B. A. C. 4647 <i>mult.</i> | 6.4 | +0.93 | -5.7 | - 7 31.4 | 14 1 50.2 | - 4 29.6 | -0.5446 | 0.5012 | -0.2326 | +12 -76 |
| W. xiii, 825 | 6.8 | 0.93 | 6.2 | 9 1.6 | 2 15.5 | - 4 5.0 | +0.9949 | 0.5015 | 0.2325 | +81 +13 |
| 91 Virginis | 6.8 | 0.99 | 6.0 | 8 22.4 | 7 53.1 | + 1 23.0 | -1.0130 | 0.5042 | 0.2296 | -16 -90 |
| 95 Virginis | 6.0 | 1.00 | 6.1 | 8 47.7 | 8 6.8 | + 1 36.3 | -0.6036 | 0.5046 | 0.2295 | + 9 -81 |
| 96 Virginis | 6.9 | 1.01 | 6.5 | 9 49.2 | 9 18.9 | + 2 46.3 | +0.2359 | 0.5047 | 0.2286 | +53 -29 |
| κ Virginis | 4.2 | +1.03 | -6.5 | - 9 46.1 | 11 22.3 | + 4 46.2 | -0.2868 | 0.5047 | -0.2276 | +24 -58 |
| 2 Libræ | 6.5 | 1.10 | 6.9 | 11 13.1 | 16 53.4 | +10 7.7 | +0.0434 | 0.5085 | 0.2236 | +41 -40 |
| μ Libræ | 5.7 | 1.26 | 7.7 | 13 41.7 | 15 6 9.0 | - 1 0.3 | -0.1708 | 0.5182 | 0.2128 | +28 -51 |
| ν^1 Libræ | 5.5 | 1.37 | 8.2 | 15 50.1 | 14 44.5 | + 7 19.5 | +0.3417 | 0.5246 | 0.2036 | +54 -24 |
| ν^2 Libræ | 6.9 | 1.38 | 8.3 | 16 3.8 | 14 49.9 | + 7 24.7 | +0.5689 | 0.5248 | 0.2034 | +63 -12 |
| 28 Libræ | 6.0 | +1.47 | -8.5 | -17 45.9 | 21 39.4 | - 9 58.7 | +1.0320 | 0.5319 | -0.1961 | +72 +17 |
| ζ^1 Libræ | 6.0 | +1.50 | -8.0 | -16 20.3 | 16 1 12.4 | - 6 32.5 | -1.0160 | 0.5328 | -0.1910 | -36 -90 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

| THE STAR'S | | | | AT CONJUNCTION IN R. A. | | | | | | | Limiting Parallels. | |
|------------------------------------|------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|---------|-----|------------------------|--|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. | |
| | | $\Delta\alpha$ | $\Delta\delta$ | | | | | | | | | |
| ζ^1 Libræ | 5.7 | +1.52 | - 8.2 | -17 4.0 | 16 1 49.8 | - 5 56.3 | -0.5231 | 0.5337 | -0.1901 | + 7 | -76 | |
| 41 Libræ | 5.9 | 1.59 | 8.5 | 18 56.6 | 6 11.6 | - 1 43.0 | +0.6625 | 0.5380 | 0.1842 | +70 | - 6 | |
| κ Libræ | 5.1 | 1.61 | 8.6 | 19 19.6 | 7 36.9 | - 0 20.6 | +0.8085 | 0.5389 | 0.1818 | +71 | + 3 | |
| λ Libræ | 5.1 | 1.68 | 8.2 | 19 50.5 | 12 52.5 | + 4 44.6 | +0.4187 | 0.5434 | 0.1737 | +54 | -19 | |
| 47 Libræ | 6.4 | 1.69 | 8.2 | 19 3.7 | 13 39.3 | + 5 29.8 | -0.5424 | 0.5441 | 0.1724 | + 4 | -78 | |
| β^1 Scorpii | 2.9 | +1.72 | - 8.1 | -19 30.5 | 18 23.1 | +10 4.0 | -0.8662 | 0.5484 | -0.1644 | -16 | -90 | |
| β^2 Scorpii | 5.5 | 1.72 | 8.1 | 19 30.3 | 18 23.2 | +10 4.1 | -0.8698 | 0.5484 | 0.1644 | -16 | -90 | |
| γ^1 Scorpii | 4.6 | 1.76 | 8.2 | 20 22.5 | 18 59.1 | +10 38.8 | -0.0493 | 0.5494 | 0.1634 | +27 | -45 | |
| ω^2 Scorpii | 4.6 | 1.77 | 8.3 | 20 34.5 | 19 14.8 | +10 53.9 | +0.1197 | 0.5493 | 0.1628 | +36 | -35 | |
| ω Ophiuchi | 4.7 | 1.89 | 7.7 | 21 14.0 | 17 6 9.2 | - 2 34.6 | -0.8513 | 0.5597 | 0.1423 | -18 | -90 | |
| 22 Ophiuchi | 6.7 | +2.04 | - 7.3 | -23 20.0 | 15 48.8 | + 6 44.0 | +0.0695 | 0.5689 | -0.1217 | +29 | -38 | |
| 24 Ophiuchi | 6.0 | 2.04 | 7.1 | 22 58.7 | 16 38.4 | + 7 31.8 | -0.4011 | 0.5692 | 0.1199 | + 5 | -67 | |
| 39 Ophiuchi <i>mult.</i> | 5.5 | 2.14 | 6.5 | 24 10.2 | 18 1 24.3 | - 8 2.0 | -0.1226 | 0.5765 | 0.0993 | +16 | -49 | |
| θ Ophiuchi | 3.3 | 2.17 | 6.5 | 24 53.6 | 3 1.3 | - 6 28.7 | +0.4714 | 0.5785 | 0.0954 | +50 | -15 | |
| ϕ Ophiuchi <i>var.</i> | 4.4 | 2.16 | 6.2 | 24 4.6 | 4 48.6 | - 4 45.5 | -0.5414 | 0.5791 | 0.0907 | - 6 | -80 | |
| α^2 Ophiuchi | 5.2 | +2.18 | - 5.9 | -23 52.8 | 6 51.2 | - 2 47.6 | -0.9241 | 0.5805 | -0.0852 | -28 | -90 | |
| B. A. C. 6194 | 5.1 | 2.37 | 4.0 | 27 5.0 | 19 1 11.8 | - 9 10.4 | +1.2530 | 0.5936 | 0.0349 | +63 | +52 | |
| λ Sagittarii | 2.9 | 2.39 | 3.1 | 25 28.9 | 5 3.8 | - 5 27.8 | -0.4965 | 0.5960 | 0.0238 | -10 | -76 | |
| ϕ Sagittarii | 3.7 | 2.44 | 2.2 | 27 6.1 | 11 48.3 | + 1 0.3 | +1.0610 | 0.5988 | -0.0036 | +63 | +25 | |
| σ Sagittarii | 2.3 | 2.47 | 1.5 | 26 25.9 | 15 29.0 | + 4 31.8 | +0.3851 | 0.5991 | +0.0074 | +36 | -20 | |
| ψ Sagittarii | 5.4 | +2.46 | - 0.1 | -25 26.6 | 23 11.4 | +11 55.1 | -0.4663 | 0.6012 | +0.0289 | - 8 | -74 | |
| λ^1 Sagittarii <i>var.</i> | 6.0 | 2.48 | + 1.2 | 24 57.5 | 20 6 56.7 | - 4 38.8 | -0.6209 | 0.6018 | 0.0545 | -14 | -88 | |
| λ^2 Sagittarii | 4.6 | 2.48 | 1.3 | 25 7.4 | 7 11.8 | - 4 24.4 | -0.4413 | 0.6020 | 0.0554 | - 5 | -71 | |
| χ Capricorni | 5.4 | 2.38 | 7.1 | 21 37.8 | 21 18 24.9 | + 5 22.3 | -0.1691 | 0.5913 | 0.1546 | +20 | -52 | |
| ϕ Capricorni | 5.5 | 2.35 | 7.4 | 21 6.2 | 21 11.8 | + 8 2.6 | -0.2537 | 0.5902 | 0.1615 | +16 | -57 | |
| 33 Capricorni | 5.7 | +2.35 | + 7.9 | -21 18.8 | 22 0 33.9 | +11 16.6 | +0.5133 | 0.5875 | +0.1692 | +58 | -14 | |
| 35 Capricorni | 6.2 | 2.35 | 8.1 | 21 39.9 | 1 47.2 | -11 33.0 | +1.0720 | 0.5867 | 0.1722 | +68 | +22 | |
| 37 Capricorni | 6.0 | 2.32 | 8.3 | 20 34.1 | 4 49.8 | - 8 37.5 | +0.5148 | 0.5854 | 0.1792 | +59 | -14 | |
| ϵ Capricorni | 4.7 | 2.31 | 8.4 | 19 57.2 | 5 43.6 | - 7 45.8 | -0.0662 | 0.5848 | 0.1811 | +34 | -38 | |
| κ Capricorni | 5.0 | 2.29 | 8.6 | 19 21.6 | 7 57.9 | - 5 36.8 | -0.1126 | 0.5834 | 0.1861 | +25 | -48 | |
| B. A. C. 7550 | 6.3 | +2.30 | + 8.7 | -20 7.0 | 8 11.5 | - 5 23.6 | +0.6820 | 0.5834 | +0.1866 | +69 | - 5 | |
| 29 Aquarii <i>mult.</i> | 6.5 | 2.22 | 9.3 | 17 29.2 | 16 0.9 | + 2 7.6 | -0.4050 | 0.5773 | 0.2022 | +12 | -67 | |
| 56 Aquarii | 6.3 | 2.09 | 10.2 | 15 8.3 | 23 3 35.6 | -10 43.6 | -0.2727 | 0.5705 | 0.2232 | +22 | -58 | |
| τ^1 Aquarii <i>mult.</i> | 5.8 | 2.00 | 10.9 | 14 37.6 | 10 58.8 | - 3 36.7 | +0.9008 | 0.5649 | 0.2329 | +75 | + 7 | |
| τ^2 Aquarii | 4.1 | 1.98 | 10.9 | 14 9.9 | 11 47.4 | - 2 49.9 | +0.6357 | 0.5654 | 0.2345 | +74 | - 8 | |
| 74 Aquarii | 6.0 | +1.95 | +10.7 | -12 11.6 | 13 28.0 | - 1 12.9 | -0.9305 | 0.5642 | +0.2366 | -13 | -90 | |
| ψ^1 Aquarii | 4.1 | 1.83 | 11.0 | 9 40.6 | 23 11.0 | + 8 9.2 | -1.0775 | 0.5575 | 0.2472 | -21 | -90 | |
| ψ^2 Aquarii | 4.2 | 1.83 | 11.1 | 9 46.5 | 24 0 5.1 | + 9 1.4 | -0.7582 | 0.5569 | 0.2480 | - 1 | -90 | |
| ψ^3 Aquarii | 4.8 | 1.82 | 11.2 | 10 12.2 | 0 32.9 | + 9 28.2 | -0.2185 | 0.5569 | 0.2484 | +28 | -54 | |
| B. A. C. 8274 | 7.0 | 1.66 | 11.4 | 6 59.0 | 13 43.1 | - 1 49.0 | -0.0748 | 0.5503 | 0.2586 | +37 | -46 | |
| 30 Piscium | 4.6 | +1.60 | +11.7 | - 6 37.0 | 19 47.1 | + 4 2.5 | +1.1380 | 0.5480 | +0.2617 | +83 | +23 | |
| 33 Piscium | 4.7 | 1.58 | 11.7 | 6 18.8 | 21 19.3 | + 5 31.5 | +1.2400 | 0.5470 | 0.2623 | +84 | +31 | |
| 14 Ceti | 6.0 | 1.41 | 10.9 | 1 6.1 | 25 11 10.7 | - 5 5.0 | -0.3144 | 0.5421 | 0.2653 | +25 | -60 | |
| 15 Ceti | 6.8 | 1.40 | 10.9 | - 1 6.1 | 12 21.4 | - 3 56.6 | -0.0034 | 0.5418 | 0.2653 | +42 | -42 | |
| 26 Ceti | 5.9 | 1.26 | 10.7 | + 0 47.2 | 26 0 18.6 | + 7 36.9 | +1.2640 | 0.5396 | 0.2677 | +90 | +33 | |
| 29 Ceti | 6.3 | +1.24 | +10.6 | + 1 25.6 | 2 15.3 | + 9 29.7 | +1.1310 | 0.5391 | +0.2628 | +90 | +22 | |
| 33 Ceti | 6.1 | 1.23 | 10.4 | 1 52.1 | 3 27.5 | +10 39.5 | +1.0010 | 0.5396 | 0.2626 | +90 | +13 | |
| 35 Ceti | 6.3 | 1.22 | 10.5 | 1 53.8 | 4 22.8 | +11 33.0 | +1.2170 | 0.5394 | 0.2622 | +90 | +29 | |
| f Piscium | 5.1 | 1.19 | 10.2 | 3 2.5 | 6 50.2 | -10 4.5 | +0.7053 | 0.5388 | 0.2609 | +90 | - 5 | |
| μ Piscium | 5.0 | 1.12 | 9.5 | 5 34.9 | 12 35.6 | - 4 30.4 | -0.3710 | 0.5383 | 0.2580 | +23 | -63 | |
| ξ Arietis | 5.3 | +0.85 | + 8.4 | +10 7.1 | 27 14 1.5 | - 3 54.8 | +1.3380 | 0.5412 | +0.2368 | +90 | +48 | |
| 31 Arietis | 5.7 | 0.79 | 7.8 | 11 58.6 | 19 26.8 | + 1 19.6 | +0.7026 | 0.5419 | 0.2302 | +90 | - 1 | |
| σ Arietis | 5.5 | 0.72 | 7.0 | 14 38.0 | 28 2 15.0 | + 7 54.2 | -0.4877 | 0.5439 | 0.2216 | +16 | -64 | |
| 13 Tauri | 5.7 | 0.48 | 5.4 | 19 21.1 | 29 1 8.3 | + 6 0.7 | -0.7001 | 0.5516 | 0.1854 | + 4 | -70 | |
| 14 Tauri | 6.3 | 0.47 | 5.5 | 19 19.3 | 1 47.3 | + 6 38.3 | -0.5494 | 0.5514 | 0.1841 | +12 | -64 | |
| B. A. C. 1242 | 6.3 | +0.40 | + 5.2 | +19 53.7 | 9 27.6 | - 9 57.4 | +0.2104 | 0.5542 | +0.1698 | +54 | -20 | |
| ω^2 Tauri | 5.7 | +0.34 | + 5.1 | +20 18.7 | 16 32.7 | - 3 7.3 | +0.9286 | 0.5571 | +0.1555 | +90 | +21 | |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

| THE STAR'S | | | | AT CONJUNCTION IN R. A. | | | | | Limiting Parallels. | |
|------------------|------|------------------------|--------------------------|--------------------------|----------------|----------|---------|--------|------------------------|---------|
| Name. | Mag. | Red'ns from 1891.0. | Apparent Declination. | Washington Mean Time. | HourAngle H | Y | z' | y' | N. | S. |
| | | $\Delta\alpha$ | $\Delta\delta$ | d h m | h m | | | | | |
| 51 Tauri | 6.0 | +0.33 | +4.8 | +21 18.9 | 29 17 0.6 | -2 40.3 | -0.0489 | 0.5572 | +0.1545 | +39 -31 |
| 53 Tauri | 6.0 | 0.33 | 4.9 | 20 52.8 | 17 28.8 | -2 13.1 | +0.4782 | 0.5572 | 0.1536 | +73 -5 |
| 56 Tauri | 6.0 | 0.33 | 4.7 | 21 30.7 | 17 32.7 | -2 9.4 | -0.1728 | 0.5572 | 0.1535 | +32 -38 |
| κ^1 Tauri | 4.7 | 0.30 | 4.6 | 22 2.7 | 20 2.5 | +0 15.1 | -0.3548 | 0.5588 | 0.1483 | +22 -48 |
| κ^2 Tauri | 6.3 | 0.30 | 4.6 | 21 57.1 | 20 3.9 | +0 16.5 | -0.2534 | 0.5588 | 0.1483 | +28 -42 |
| ν^1 Tauri | 4.7 | +0.30 | +4.4 | +22 34.0 | 20 26.4 | +0 38.2 | -0.8443 | 0.5588 | +0.1472 | -6 -67 |
| ν^2 Tauri | 6.0 | 0.30 | 4.4 | 22 45.1 | 20 52.2 | +1 3.0 | -0.9736 | 0.5586 | 0.1463 | -15 -67 |
| B. A. C. 1373 | 6.0 | 0.30 | 4.8 | 21 22.5 | 21 12.3 | +1 22.5 | +0.5174 | 0.5585 | 0.1454 | +76 -1 |
| τ Tauri | 4.5 | 0.24 | 4.4 | 22 45.0 | 30 3 21.1 | +7 18.1 | -0.0718 | 0.5603 | 0.1324 | +38 -30 |
| 95 Tauri | 6.3 | 0.24 | 4.0 | 23 53.0 | 3 45.2 | +7 41.4 | -1.2110 | 0.5613 | 0.1314 | -38 -66 |
| 99 Tauri | 6.0 | +0.18 | +4.0 | +23 46.7 | 10 2.0 | -10 15.4 | -0.3217 | 0.5628 | +0.1169 | +24 -42 |
| 103 Tauri | 6.0 | 0.15 | 4.0 | 24 7.3 | 14 26.3 | -6 0.6 | -0.1919 | 0.5635 | 0.1065 | +31 -34 |
| 118 Tauri | 5.7 | 0.08 | 3.7 | 25 3.7 | 23 26.6 | +2 40.0 | -0.3251 | 0.5654 | 0.0847 | +24 -40 |
| 121 Tauri | 6.0 | 0.06 | 3.9 | 23 57.9 | 31 2 5.7 | +5 13.4 | +1.0550 | 0.5662 | 0.0783 | +90 +38 |
| 125 Tauri | 6.0 | 0.05 | 3.4 | 25 50.2 | 3 52.2 | +6 55.9 | -0.7982 | 0.5667 | 0.0738 | -4 -64 |
| 132 Tauri | 5.3 | +0.02 | +3.7 | +24 31.8 | 7 50.2 | +10 45.3 | +0.8654 | 0.5666 | +0.0638 | +90 +27 |
| 139 Tauri | 5.3 | -0.01 | +3.4 | +25 56.4 | 11 36.7 | -9 36.5 | -0.4138 | 0.5672 | +0.0544 | +19 -43 |

AUGUST.

| | | | | | | | | | | |
|-------------------------|-----|-------|------|----------|-----------|----------|---------|--------|---------|---------|
| ϵ Geminorum | 3.2 | -0.13 | +3.9 | +25 14.3 | 1 7 7.1 | +9 11.1 | +0.9141 | 0.5663 | +0.0043 | +90 +35 |
| 37 Geminorum | 6.3 | 0.15 | 3.9 | 25 30.8 | 11 58.1 | -10 8.5 | +0.6110 | 0.5654 | -0.0081 | +88 +17 |
| 39 Geminorum | 6.3 | 0.16 | 3.8 | 26 13.5 | 13 26.8 | -8 43.0 | -0.1702 | 0.5648 | 0.0118 | +32 -24 |
| 40 Geminorum | 6.3 | 0.16 | 3.9 | 26 3.9 | 13 43.8 | -8 26.6 | -0.0018 | 0.5648 | 0.0125 | +42 -15 |
| 47 Geminorum | 6.0 | 0.18 | 3.8 | 27 2.2 | 18 49.6 | -3 31.8 | -1.1463 | 0.5645 | 0.0253 | -34 -63 |
| 52 Geminorum | 6.3 | -0.19 | +4.1 | +25 4.5 | 20 17.5 | -2 7.1 | +0.9296 | 0.5637 | -0.0292 | +90 +34 |
| A Geminorum | 5.7 | 0.20 | 4.0 | 25 15.6 | 2 0 5.1 | +1 32.3 | +0.6025 | 0.5618 | 0.0384 | +87 +14 |
| κ Geminor. mult. | 3.6 | 0.21 | 4.1 | 24 39.7 | 9 13.6 | +10 21.2 | +0.7996 | 0.5586 | 0.0607 | +90 +23 |
| NEW MOON. | | | | | | | | | | |
| η Leonis | 3.3 | -0.15 | +3.7 | +17 17.7 | 5 4 26.9 | +3 22.1 | +0.1508 | 0.5195 | -0.1868 | +51 -26 |
| ι Leonis | 5.7 | 0.11 | 3.3 | 14 41.9 | 17 17.0 | -8 10.7 | +0.5222 | 0.5131 | 0.2023 | +75 -9 |
| k Leonis | 5.7 | -0.07 | 3.1 | 14 46.3 | 6 0 46.5 | -0 54.2 | -1.1020 | 0.5081 | 0.2099 | -21 -75 |
| ω Virginis | 5.9 | +0.05 | 1.6 | 8 44.4 | 7 5 4.4 | +2 36.1 | -0.6778 | 0.4967 | 0.2310 | +6 -81 |
| ν Virginis | 4.0 | 0.06 | +1.2 | 7 8.4 | 9 11.4 | +6 36.3 | +0.1463 | 0.4954 | 0.2320 | +50 -33 |
| ϵ Virginis | 5.5 | +0.18 | 0.0 | +3 55.2 | 8 4 34.9 | +1 23.5 | -0.8650 | 0.4913 | -0.2394 | -4 -86 |
| 46 Virginis | 6.1 | 0.33 | -2.4 | -2 46.9 | 9 3 17.7 | -0 25.2 | +1.1055 | 0.4902 | 0.2404 | +87 +20 |
| 48 Virginis | 6.7 | 0.35 | 2.5 | 3 4.6 | 5 9.4 | +1 23.5 | +0.9854 | 0.4905 | 0.2402 | +87 +11 |
| 65 Virginis | 6.1 | 0.43 | 3.1 | 4 21.3 | 16 2.5 | +11 59.0 | -0.2081 | 0.4928 | 0.2382 | +31 -54 |
| 66 Virginis | 6.0 | 0.44 | 3.2 | 4 35.6 | 16 43.2 | -11 21.9 | -0.1050 | 0.4932 | 0.2382 | +35 -48 |
| ι^2 Virginis | 5.1 | +0.47 | -3.6 | -5 41.7 | 20 51.4 | -7 19.9 | +0.1289 | 0.4945 | -0.2371 | +48 -35 |
| 80 Virginis | 6.1 | 0.49 | 3.3 | 4 50.5 | 22 49.9 | -5 24.7 | -1.2830 | 0.4945 | 0.2361 | -37 -90 |
| 88 Virginis | 6.8 | 0.55 | 4.0 | 6 17.7 | 10 5 52.4 | +1 26.3 | -1.3280 | 0.4966 | 0.2332 | -43 -90 |
| B. A. C. 4647 mult. | 6.4 | 0.58 | 4.4 | 7 31.4 | 9 31.3 | +4 59.1 | -0.8239 | 0.4986 | 0.2316 | -5 -90 |
| W. xiii, 825 | 6.8 | 0.58 | 4.9 | 9 1.6 | 9 56.9 | +5 24.0 | +0.7321 | 0.4987 | 0.2314 | +80 -3 |
| 94 Virginis | 6.8 | +0.64 | -4.7 | -8 22.4 | 15 39.2 | +10 56.8 | -1.2970 | 0.5007 | -0.2282 | -40 -90 |
| 95 Virginis | 6.0 | 0.65 | 4.9 | 8 47.7 | 15 53.0 | +11 10.2 | -0.8847 | 0.5010 | 0.2282 | -8 -90 |
| 96 Virginis | 6.9 | 0.65 | 5.2 | 9 49.2 | 17 6.2 | -11 38.7 | -0.0384 | 0.5010 | 0.2271 | +37 -44 |
| κ Virginis | 4.2 | 0.68 | 5.2 | 9 46.1 | 19 11.3 | -9 27.1 | -0.5667 | 0.5024 | 0.2260 | +10 -78 |
| 2 Libræ | 6.5 | 0.73 | 5.7 | 11 13.1 | 11 0 47.0 | -4 11.0 | -0.2299 | 0.5050 | 0.2221 | +27 -55 |
| 5 Libræ | 6.6 | +0.87 | -7.0 | -15 0.1 | 12 31.5 | +7 13.0 | +1.3510 | 0.5125 | -0.2124 | +75 +51 |
| μ Libræ | 5.7 | 0.89 | 6.6 | 13 41.7 | 14 16.4 | +8 54.9 | -0.4446 | 0.5130 | 0.2106 | +14 -69 |
| ν^1 Libræ | 5.5 | 1.00 | 7.3 | 15 50.1 | 23 1.4 | -6 35.8 | +0.0796 | 0.5196 | 0.2015 | +39 -38 |
| ν^2 Libræ | 6.9 | 1.00 | 7.4 | 16 3.8 | 23 7.0 | -6 30.4 | +0.3091 | 0.5195 | 0.2013 | +52 -25 |
| 28 Libræ | 6.0 | 1.09 | 7.8 | 17 45.9 | 12 6 4.4 | +0 14.1 | +0.7764 | 0.5243 | 0.1938 | +73 0 |
| ζ^2 Libræ | 7.0 | +1.15 | -7.5 | -17 4.0 | 10 19.8 | +4 21.5 | -0.7861 | 0.5266 | -0.1870 | -8 -90 |
| 41 Libræ | 5.9 | +1.21 | -8.0 | -18 56.6 | 14 47.0 | +8 40.3 | +0.4140 | 0.5313 | -0.1810 | +56 -20 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

| THE STAR'S | | | | AT CONJUNCTION IN R. A. | | | | | | Limiting Parallels. | |
|------------------------------------|-------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|---------|------------------------|-----|
| Name. | Magn. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. |
| | | $\Delta\alpha$ | $\Delta\delta$ | | d h m | h m | | | | | |
| κ Libræ | 5.1 | +1.23 | - 8.1 | -19 19.6 | 19 16 14.1 | +10 4.5 | +0.5662 | 0.5325 | -0.1791 | +64 | -11 |
| λ Libræ | 5.1 | 1.31 | 8.1 | 19 50.5 | 21 36.4 | - 8 43.6 | +0.1768 | 0.5371 | 0.1709 | +40 | -32 |
| 47 Libræ | 6.4 | 1.32 | 7.8 | 19 3.7 | 22 24.1 | - 7 57.5 | -0.7947 | 0.5385 | 0.1696 | -11 | -90 |
| β^1 Scorpii | 2.9 | 1.39 | 7.8 | 19 30.5 | 13 3 14.0 | - 3 17.2 | -1.1130 | 0.5418 | 0.1615 | -33 | -90 |
| β^2 Scorpii | 5.5 | 1.39 | 7.8 | 19 30.3 | 3 14.1 | - 3 17.1 | -1.1170 | 0.5418 | 0.1615 | -33 | -90 |
| ω^1 Scorpii | 4.6 | +1.40 | - 8.0 | -20 22.5 | 3 50.8 | - 2 41.6 | -0.2865 | 0.5425 | -0.1605 | +15 | -59 |
| ω^2 Scorpii | 4.6 | 1.41 | 8.1 | 20 34.5 | 4 6.8 | - 2 26.2 | -0.1168 | 0.5426 | 0.1602 | +24 | -49 |
| ω Ophiuchi | 4.7 | 1.57 | 7.7 | 21 14.0 | 15 15.2 | + 8 19.4 | -1.0850 | 0.5528 | 0.1395 | -34 | -90 |
| 22 Ophiuchi | 6.7 | 1.75 | 7.6 | 23 20.0 | 14 1 7.1 | - 6 9.7 | -0.1386 | 0.5613 | 0.1191 | -18 | -50 |
| 24 Ophiuchi | 6.0 | 1.76 | 7.5 | 22 58.7 | 1 57.8 | - 5 20.8 | -0.6141 | 0.5630 | 0.1174 | + 7 | -87 |
| B. A. C. 5709 | 6.3 | +1.79 | - 8.0 | -24 55.6 | 3 16.5 | - 4 5.0 | +1.2835 | 0.5627 | -0.1142 | +65 | +53 |
| 26 Ophiuchi | 6.1 | 1.80 | 8.0 | 24 49.5 | 3 21.4 | - 4 0.2 | +1.1680 | 0.5627 | 0.1140 | +65 | +34 |
| 39 Ophiuchi <i>mult.</i> | 5.5 | 1.90 | 7.4 | 24 10.2 | 10 54.5 | + 3 16.2 | -0.3188 | 0.5694 | 0.0967 | + 7 | -62 |
| B. A. C. 5831 | 6.5 | 1.89 | 7.4 | 23 57.2 | 10 57.0 | + 3 18.6 | -0.5488 | 0.5694 | 0.0965 | - 6 | -80 |
| θ Ophiuchi | 3.3 | 1.92 | 7.4 | 24 53.6 | 12 33.3 | + 4 51.4 | +0.2822 | 0.5717 | 0.0927 | +38 | -26 |
| b Ophiuchi <i>var.</i> | 4.4 | +1.94 | - 6.9 | -24 4.6 | 14 22.7 | + 6 36.7 | -0.7303 | 0.5722 | -0.0881 | -16 | -90 |
| c^1 Ophiuchi | 5.2 | 1.97 | 6.9 | 23 52.8 | 16 27.7 | + 8 36.9 | -1.1160 | 0.5740 | 0.0827 | -43 | -90 |
| 63 Ophiuchi | 6.6 | 2.13 | 6.6 | 24 52.0 | 13 1 58.6 | - 6 14.0 | -0.7598 | 0.5824 | 0.0582 | -22 | -90 |
| B. A. C. 6194 | 5.1 | 2.28 | 6.1 | 27 5.0 | 11 7.6 | + 2 33.5 | +1.1370 | 0.5876 | 0.0331 | +63 | +32 |
| λ Sagittarii | 2.9 | 2.31 | 4.9 | 25 28.9 | 15 3.1 | + 6 19.6 | -0.6409 | 0.5896 | 0.0217 | -17 | -90 |
| B. A. C. 6369 | 6.2 | +2.38 | - 3.2 | -25 7.1 | 21 36.4 | -11 22.9 | -1.0900 | 0.5933 | -0.0024 | -48 | -90 |
| ϕ Sagittarii | 3.7 | 2.42 | 3.7 | 27 6.1 | 21 53.0 | -11 7.0 | +0.9367 | 0.5937 | -0.0017 | +63 | +15 |
| σ Sagittarii | 2.3 | 2.45 | 2.8 | 26 25.9 | 16 1 36.3 | - 7 32.7 | +0.2670 | 0.5957 | +0.0095 | +30 | -27 |
| ψ Sagittarii | 5.4 | 2.51 | 1.0 | 25 26.6 | 9 23.6 | - 0 4.6 | -0.5727 | 0.5973 | 0.0329 | -13 | -83 |
| χ^1 Sagittarii | 5.4 | 2.54 | - 0.2 | 24 43.2 | 13 7.2 | + 3 29.6 | -1.1600 | 0.5984 | 0.0440 | -50 | -90 |
| λ^1 Sagittarii <i>var.</i> | 6.0 | +2.59 | + 0.5 | -24 57.5 | 17 12.6 | + 7 25.2 | -0.7093 | 0.5987 | +0.0565 | -18 | -90 |
| λ^2 Sagittarii | 4.6 | 2.58 | 0.5 | 25 7.4 | 17 27.8 | + 7 39.8 | -0.5295 | 0.5988 | 0.0573 | - 9 | -79 |
| χ Capricorni | 5.4 | 2.70 | 7.2 | 21 37.8 | 18 4 39.9 | - 6 34.6 | -0.1749 | 0.5929 | 0.1576 | +19 | -52 |
| ϕ Capricorni | 5.5 | 2.69 | 7.6 | 21 6.2 | 7 25.5 | - 3 55.6 | -0.2508 | 0.5920 | 0.1646 | +16 | -57 |
| 33 Capricorni | 5.7 | 2.70 | 8.2 | 21 18.8 | 10 45.8 | - 0 43.4 | +0.5205 | 0.5902 | 0.1728 | +59 | -14 |
| 35 Capricorni | 6.2 | +2.70 | + 8.4 | -21 39.9 | 11 58.3 | + 0 26.2 | +1.0790 | 0.5898 | +0.1758 | +68 | +23 |
| 37 Capricorni | 6.0 | 2.68 | 8.9 | 20 34.1 | 14 59.0 | + 3 19.8 | +0.5328 | 0.5882 | 0.1827 | +61 | -13 |
| ϵ Capricorni | 4.7 | 2.66 | 9.1 | 19 57.2 | 15 52.2 | + 4 10.9 | +0.0904 | 0.5879 | 0.1847 | +36 | -37 |
| κ Capricorni | 5.0 | 2.64 | 9.5 | 19 21.6 | 18 4.9 | + 6 18.3 | -0.0621 | 0.5864 | 0.1895 | +27 | -47 |
| τ^1 Aquarii <i>mult.</i> | 5.8 | 2.50 | 13.2 | 14 37.6 | 20 37.2 | + 7 49.7 | +0.9901 | 0.5725 | 0.2385 | +75 | +13 |
| τ^2 Aquarii | 4.1 | +2.49 | +13.3 | -14 9.9 | 21 24.7 | + 8 35.4 | +0.7266 | 0.5719 | +0.2397 | +75 | - 3 |
| ψ^1 Aquarii | 4.1 | 2.39 | 14.1 | 9 40.6 | 20 8 31.9 | - 4 41.9 | -0.9345 | 0.5659 | 0.2532 | -11 | -90 |
| ψ^2 Aquarii | 4.2 | 2.38 | 14.2 | 9 46.5 | 9 24.5 | - 3 51.2 | -0.6170 | 0.5655 | 0.2542 | + 7 | -83 |
| ψ^3 Aquarii | 4.8 | 2.37 | 14.3 | 10 12.2 | 9 51.5 | - 3 25.2 | -0.0818 | 0.5652 | 0.2547 | +35 | -47 |
| 30 Piscium | 4.6 | 2.23 | 15.3 | 6 37.0 | 21 4 33.3 | - 9 28.4 | +1.2985 | 0.5564 | 0.2630 | +83 | +37 |
| 14 Ceti | 6.0 | +2.10 | +15.1 | - 1 6.1 | 19 28.7 | + 5 0.8 | -0.1020 | 0.5505 | +0.2711 | +37 | -47 |
| 15 Ceti | 6.8 | 2.09 | 15.0 | - 1 6.1 | 20 37.2 | + 6 7.0 | +0.2075 | 0.5505 | 0.2715 | +53 | -31 |
| f Piscium | 5.1 | 1.93 | 14.8 | + 3 2.6 | 22 14 31.0 | - 0 35.9 | +0.9303 | 0.5478 | 0.2668 | +90 | + 9 |
| μ Piscium | 5.0 | 1.89 | 14.2 | 5 35.0 | 20 5.7 | + 4 47.3 | -0.1198 | 0.5479 | 0.2637 | +36 | -48 |
| 31 Arietis | 5.7 | 1.62 | 12.1 | 11 58.7 | 24 2 3.8 | + 9 44.2 | +0.9627 | 0.5491 | 0.2338 | +90 | +15 |
| σ Arietis | 6.0 | +1.60 | +11.1 | +14 51.2 | 5 35.4 | -10 51.5 | -1.1390 | 0.5494 | +0.2258 | -24 | -75 |
| σ Arietis | 5.5 | 1.57 | 11.1 | 14 38.1 | 8 41.8 | - 7 51.5 | -0.2135 | 0.5502 | 0.2244 | +31 | -48 |
| 13 Tauri | 5.7 | 1.37 | 8.8 | 19 21.2 | 25 7 6.3 | -10 13.9 | -0.4279 | 0.5558 | 0.1864 | +19 | -56 |
| 14 Tauri | 6.3 | 1.36 | 8.8 | 19 19.4 | 7 44.6 | - 9 36.9 | -0.2783 | 0.5558 | 0.1850 | +27 | -47 |
| B. A. C. 1242 | 6.3 | 1.28 | 8.4 | 19 53.8 | 15 17.6 | - 2 20.0 | +0.4716 | 0.5578 | 0.1703 | +72 | - 7 |
| A^1 Tauri | 4.7 | +1.29 | + 7.7 | +21 47.1 | 16 48.5 | - 0 52.4 | -1.2290 | 0.5576 | +0.1671 | -38 | -68 |
| A^2 Tauri | 6.3 | 1.28 | 7.7 | 21 43.0 | 17 5.1 | - 0 36.3 | -1.1110 | 0.5576 | 0.1665 | -25 | -68 |
| ω^3 Tauri | 5.7 | 1.22 | 8.0 | 20 18.7 | 22 16.9 | + 4 24.3 | +1.1840 | 0.5593 | 0.1556 | +90 | +41 |
| 51 Tauri | 6.0 | 1.22 | 7.7 | 21 18.9 | 22 44.3 | + 4 50.8 | +0.2114 | 0.5595 | 0.1544 | +55 | -18 |
| 53 Tauri | 6.0 | 1.21 | 7.7 | 20 52.8 | 23 12.4 | + 5 17.9 | +0.7365 | 0.5595 | 0.1536 | +90 | +10 |
| 56 Tauri | 6.0 | +1.21 | + 7.5 | +21 30.7 | 23 16.1 | + 5 21.4 | +0.0884 | 0.5595 | +0.1535 | +47 | -24 |
| κ^1 Tauri | 4.7 | +1.19 | + 7.4 | +22 2.7 | 26 1 44.2 | + 7 44.2 | -0.0955 | 0.5602 | +0.1479 | +37 | -33 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | Limiting Parallels. | |
|--------------------------------|------|---------------------|----------------|-----------------------|-------------------------|--------------|---------|--------|---------|---------------------|-----|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. |
| | | $\Delta\alpha$ | $\Delta\delta$ | | d h m | h m | | | | | |
| κ^2 Tauri | 6.3 | +1.19 | +7.3 | +21° 57.1 | 26 1 45.5 | + 7 45.5 | +0.0051 | 0.5602 | +0.1479 | +42 | -28 |
| ν^1 Tauri | 4.7 | 1.19 | 6.8 | 22 34.0 | 2 7.8 | + 8 7.0 | -0.5816 | 0.5602 | 0.1472 | +10 | -61 |
| ν^2 Tauri | 6.0 | 1.19 | 6.7 | 22 45.1 | 2 33.3 | + 8 31.5 | -0.7117 | 0.5602 | 0.1460 | + 2 | -67 |
| B. A. C. 1373 | 6.0 | 1.18 | 7.3 | 21 22.5 | 2 53.2 | + 8 50.8 | +0.7772 | 0.5611 | 0.1455 | +90 | +13 |
| τ Tauri | 4.5 | 1.13 | 6.6 | 22 45.0 | 8 58.2 | - 9 17.4 | +0.1816 | 0.5627 | 0.1318 | +53 | -17 |
| 95 Tauri | 6.3 | +1.13 | +6.1 | +23 53.0 | 9 22.1 | - 8 54.4 | -0.9528 | 0.5627 | +0.1309 | -14 | -66 |
| 99 Tauri | 6.0 | 1.07 | 5.9 | 23 46.7 | 15 35.8 | - 2 54.2 | -0.0770 | 0.5635 | 0.1161 | +38 | -29 |
| k Tauri | 6.0 | 1.07 | 5.5 | 24 53.0 | 15 43.3 | - 2 47.0 | -1.2230 | 0.5635 | 0.1158 | -40 | -65 |
| 103 Tauri | 6.0 | 1.02 | 5.6 | 24 7.3 | 19 58.6 | + 1 19.0 | +0.0491 | 0.5639 | 0.1081 | +45 | -22 |
| 118 Tauri | 5.7 | 0.94 | 4.8 | 25 3.8 | 27 4 56.4 | + 9 57.2 | -0.0952 | 0.5650 | 0.0836 | +37 | -27 |
| 125 Tauri | 6.0 | +0.90 | +4.4 | +25 50.3 | 9 21.3 | - 9 47.6 | -0.5741 | 0.5650 | +0.0724 | +10 | -54 |
| 132 Tauri | 5.3 | 0.85 | 4.6 | 24 31.9 | 13 18.8 | - 5 58.7 | +1.0810 | 0.5653 | 0.0622 | +90 | +42 |
| 139 Tauri | 5.3 | 0.82 | 4.0 | 25 56.5 | 17 5.1 | - 2 20.7 | -0.1986 | 0.5653 | 0.0528 | +31 | -30 |
| ϵ Geminorum | 3.2 | 0.62 | 3.6 | 25 14.4 | 28 12 38.3 | - 7 30.3 | +1.1055 | 0.5641 | +0.0027 | +90 | +48 |
| 37 Geminorum | 6.3 | 0.58 | 3.4 | 25 30.8 | 17 30.7 | - 2 48.5 | +0.7900 | 0.5628 | -0.0097 | +90 | +27 |
| 39 Geminorum | 6.3 | +0.57 | +3.2 | +26 13.5 | 19 0.0 | - 1 22.5 | +0.0072 | 0.5620 | -0.0133 | +43 | -15 |
| 40 Geminorum | 6.3 | 0.57 | 3.2 | 26 3.9 | 19 17.0 | - 1 6.0 | +0.1760 | 0.5619 | 0.0142 | +53 | - 7 |
| 47 Geminorum | 6.0 | 0.53 | 2.8 | 27 2.2 | 29 0 24.4 | + 3 50.3 | -0.9602 | 0.5611 | 0.0268 | -18 | -63 |
| 52 Geminorum | 6.3 | 0.51 | 3.3 | 25 4.5 | 1 53.0 | + 5 15.8 | +1.0970 | 0.5604 | 0.0307 | +90 | +46 |
| A Geminorum | 5.7 | 0.48 | 3.1 | 25 15.6 | 5 42.1 | + 8 56.7 | +0.7617 | 0.5593 | 0.0401 | +90 | +23 |
| c Geminorum | 6.0 | +0.40 | +2.7 | +26 2.7 | 14 44.3 | - 6 20.3 | -0.5489 | 0.5560 | -0.0621 | +11 | -52 |
| κ Geminor. <i>mult.</i> | 3.6 | 0.40 | 3.0 | 24 39.7 | 14 54.8 | - 6 10.2 | +0.9439 | 0.5558 | 0.0622 | +90 | +32 |
| ω^1 Canori | 6.0 | 0.35 | 3.0 | 25 41.5 | 22 13.4 | + 0 53.1 | -0.6952 | 0.5520 | 0.0792 | + 2 | -64 |
| ω^2 Canori | 6.3 | 0.34 | 2.6 | 25 23.5 | 22 35.3 | + 1 14.2 | -0.3957 | 0.5517 | 0.0801 | +20 | -43 |
| ψ^2 Canori | 5.7 | 0.32 | 2.4 | 25 50.4 | 30 2 30.4 | + 5 1.3 | -1.2160 | 0.5503 | 0.0886 | -41 | -64 |
| λ Canori | 5.7 | +0.29 | +2.6 | +24 22.0 | 7 6.3 | + 9 27.8 | -0.0401 | 0.5478 | -0.0989 | +40 | -25 |
| ν^1 Canori | 6.0 | 0.28 | 2.4 | 24 53.6 | 9 53.6 | -11 50.6 | -0.8999 | 0.5460 | 0.1046 | -11 | -65 |
| ν^2 Canori | 5.8 | 0.27 | 2.4 | 24 30.4 | 10 47.8 | -10 58.2 | -0.5685 | 0.5454 | 0.1066 | +10 | -57 |
| ν^3 Canori | 6.0 | 0.26 | 2.4 | 24 27.0 | 12 7.8 | - 9 40.9 | -0.6558 | 0.5445 | 0.1093 | + 5 | -63 |
| ν^4 Canori | 5.7 | 0.26 | 2.4 | 24 27.4 | 12 48.9 | - 9 1.2 | -0.7377 | 0.5440 | 0.1108 | 0 | -65 |
| ξ Canori | 5.0 | +0.18 | +2.2 | +22 29.3 | 31 5 55.1 | + 7 31.3 | -0.7656 | 0.5348 | -0.1438 | - 1 | -68 |
| 79 Canori | 6.3 | 0.17 | 2.2 | 22 26.4 | 6 23.5 | + 7 58.8 | -0.7784 | 0.5343 | 0.1445 | - 2 | -68 |
| B. A. C. 3138 | 6.3 | 0.16 | 2.3 | 21 44.0 | 7 58.5 | + 9 30.7 | -0.2362 | 0.5329 | 0.1473 | +29 | -41 |
| B. A. C. 3206 | 6.3 | +0.14 | +2.3 | +20 15.6 | 13 23.6 | - 9 14.5 | +0.7156 | 0.5297 | -0.1551 | +90 | + 8 |

SEPTEMBER.

| | | | | | | | | | | | |
|----------------------------|-----|-------|------|----------|-----------|----------|---------|--------|---------|-----|-----|
| η Leonis | 3.3 | +0.07 | +2.1 | +17 17.7 | 1 10 39.6 | +11 22.2 | +0.1486 | 0.5183 | -0.1886 | +51 | -26 |
| NEW MOON. | | | | | | | | | | | |
| ϵ Virginis | 5.5 | +0.06 | 0.0 | + 3 55.2 | 4 11 0.8 | + 9 41.9 | -1.0430 | 0.4918 | -0.2417 | -15 | -86 |
| 46 Virginis | 6.1 | 0.13 | -1.6 | - 2 46.9 | 5 9 45.5 | + 7 50.1 | +0.8909 | 0.4917 | 0.2427 | +87 | + 5 |
| 48 Virginis | 6.7 | 0.14 | 1.7 | 3 4.6 | 11 37.5 | + 9 39.2 | +0.7612 | 0.4917 | 0.2425 | +80 | - 2 |
| 65 Virginis | 6.1 | 0.20 | 2.2 | 4 21.3 | 22 32.2 | - 3 43.8 | -0.4494 | 0.4931 | 0.2400 | +18 | -69 |
| 66 Virginis | 6.0 | 0.20 | 2.3 | 4 35.6 | 23 13.0 | - 3 4.1 | -0.3476 | 0.4932 | 0.2399 | +23 | -62 |
| δ Virginis | 5.1 | +0.22 | -2.6 | - 5 41.7 | 6 3 22.0 | + 0 58.2 | -0.1183 | 0.4945 | -0.2386 | +35 | -49 |
| ω Virginis | 5.4 | 0.24 | 3.4 | 8 9.2 | 8 42.6 | + 6 10.9 | +1.3360 | 0.4949 | 0.2362 | +82 | +42 |
| B. A. C. 4647 <i>mult.</i> | 6.4 | 0.30 | 3.4 | 7 31.4 | 16 5.6 | -10 39.1 | -1.0920 | 0.4971 | 0.2325 | -21 | -90 |
| W. xiii, 825 | 6.8 | 0.30 | 3.8 | 9 1.6 | 16 31.2 | -10 14.1 | +0.4697 | 0.4972 | 0.2323 | +69 | -18 |
| 95 Virginis | 6.0 | 0.34 | 3.8 | 8 47.7 | 22 29.5 | - 4 25.7 | -1.1600 | 0.4991 | 0.2385 | -26 | -90 |
| 96 Virginis | 6.9 | +0.35 | -4.1 | - 9 49.2 | 23 43.1 | - 3 14.2 | -0.3107 | 0.4997 | -0.2278 | +25 | -61 |
| κ Virginis | 4.2 | 0.36 | 4.1 | 9 46.1 | 7 1 49.2 | - 1 11.6 | -0.8439 | 0.5011 | 0.2265 | - 6 | -90 |
| 2 Libræ | 6.5 | 0.40 | 4.6 | 11 13.1 | 7 27.8 | + 4 17.4 | -0.5138 | 0.5031 | 0.2222 | +12 | -74 |
| 5 Libræ | 6.6 | 0.50 | 5.9 | 15 0.1 | 19 18.9 | - 8 12.0 | +1.0680 | 0.5092 | 0.2119 | +75 | +19 |
| μ Libræ | 5.7 | 0.52 | 5.5 | 13 41.7 | 21 4.8 | - 6 29.1 | -0.7369 | 0.5109 | 0.2103 | - 2 | -90 |
| α^1 Libræ | 6.3 | +0.52 | -6.1 | -15 32.7 | 21 45.8 | - 5 49.4 | +1.1480 | 0.5111 | -0.2098 | +74 | +25 |
| α^2 Libræ | 2.9 | +0.52 | -6.1 | -15 35.4 | 21 51.8 | - 5 43.5 | +1.1780 | 0.5111 | -0.2095 | +74 | +28 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

| THE STAR'S | | | | AT CONJUNCTION IN R. A. | | | | | | Limiting Parallels. | |
|------------------------------------|------|------------------------|----------------|-------------------------|--------------------------|-----------------|---------|--------|---------|------------------------|-----|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination | Washington Mean Time. | Hour Angle H | Y | π' | y' | N. | S. |
| | | $\Delta\alpha$ | $\Delta\delta$ | | $d^{\circ} h^m s$ | $h^m s$ | | | | | |
| ν^1 Libræ | 5.5 | +0.60 | -6.2 | -15 50.1 | 5 56.3 | +2 6.7 | -0.2113 | 0.5157 | -0.2005 | +25 | -54 |
| ν^2 Libræ | 6.9 | 0.61 | 6.3 | 16 3.8 | 6 2.0 | +2 12.2 | +0.0201 | 0.5159 | 0.2005 | +36 | -41 |
| 28 Libræ | 6.0 | 0.68 | 6.8 | 17 45.9 | 13 5.3 | +9 2.6 | +0.4891 | 0.5208 | 0.1922 | +61 | -17 |
| ζ^2 Libræ | 7.0 | 0.74 | 6.6 | 17 4.0 | 17 24.7 | -10 46.0 | -1.0890 | 0.5236 | 0.1864 | -28 | -90 |
| B. A. C. 5109 | 6.2 | 0.75 | 7.3 | 19 18.1 | 18 51.7 | -9 21.7 | +1.0740 | 0.5240 | 0.1843 | +71 | +21 |
| 41 Libræ | 5.9 | +0.80 | -7.1 | -18 56.6 | 21 56.5 | -6 22.6 | +0.1232 | 0.5272 | -0.1801 | +39 | -35 |
| κ Libræ | 5.1 | 0.82 | 7.2 | 19 19.6 | 23 25.0 | -4 57.0 | +0.2766 | 0.5278 | 0.1776 | +47 | -27 |
| λ Libræ | 5.1 | 0.89 | 7.3 | 19 50.5 | 9 53.1 | +0 20.7 | -0.1155 | 0.5316 | 0.1694 | +25 | -48 |
| 47 Libræ | 6.4 | 0.90 | 7.0 | 19 3.7 | 5 41.8 | +1 7.8 | -1.0930 | 0.5316 | 0.1680 | -30 | -90 |
| ω^1 Scorpii | 4.6 | 0.97 | 7.3 | 20 22.5 | 11 15.0 | +6 30.3 | -0.5844 | 0.5363 | 0.1590 | 0 | -82 |
| ω^2 Scorpii | 4.6 | +0.98 | -7.4 | -20 34.5 | 11 31.3 | +6 46.0 | -0.4100 | 0.5369 | -0.1585 | +9 | -68 |
| ρ Ophiuchi <i>mult.</i> | 5.0 | 1.11 | 8.0 | 23 11.8 | 19 53.0 | -9 8.9 | +1.1480 | 0.5430 | 0.1433 | +67 | +30 |
| 18 Ophiuchi | 6.7 | 1.27 | 8.0 | 24 27.0 | 10 43.5 | +1 19.3 | -1.0420 | 0.5517 | 0.1219 | +66 | +21 |
| 22 Ophiuchi | 6.7 | 1.30 | 7.5 | 23 20.0 | 9 0.3 | +3 31.2 | -0.4234 | 0.5544 | 0.1172 | +4 | -70 |
| 24 Ophiuchi | 6.0 | 1.31 | 7.4 | 22 58.7 | 9 52.3 | +4 21.5 | -0.9005 | 0.5544 | 0.1152 | -23 | -90 |
| B. A. C. 5709 | 6.3 | +1.34 | -8.0 | -24 55.6 | 11 13.0 | +5 39.3 | +1.1090 | 0.5554 | -0.1125 | +65 | +20 |
| 26 Ophiuchi | 6.1 | 1.34 | 7.9 | 24 49.5 | 11 18.0 | +5 44.1 | +0.9040 | 0.5555 | 0.1123 | +65 | +11 |
| 39 Ophiuchi <i>mult.</i> | 5.5 | 1.46 | 7.3 | 24 10.2 | 19 2.9 | -10 47.6 | -0.5936 | 0.5615 | 0.0947 | -8 | -85 |
| B. A. C. 5831 | 6.5 | 1.46 | 7.2 | 23 57.2 | 19 5.5 | -10 45.1 | -0.8268 | 0.5615 | 0.0945 | -22 | -90 |
| θ Ophiuchi | 3.3 | 1.49 | 7.4 | 24 53.6 | 20 44.4 | -9 9.7 | +0.0177 | 0.5620 | 0.0908 | +24 | -41 |
| b Ophiuchi <i>var.</i> | 4.4 | +1.52 | -7.0 | -24 4.6 | 22 36.7 | -7 21.5 | -1.0130 | 0.5642 | -0.0863 | -34 | -90 |
| 63 Ophiuchi | 6.6 | 1.73 | 6.4 | 24 52.0 | 11 10 32.0 | +4 7.2 | -1.0240 | 0.5716 | 0.0564 | -38 | -90 |
| B. A. C. 6194 | 5.1 | 1.80 | 6.2 | 27 5.0 | 19 56.6 | -10 49.6 | +0.8798 | 0.5781 | 0.0292 | +63 | +10 |
| λ Sagittarii | 2.9 | 1.94 | 5.1 | 25 28.9 | 23 59.0 | -6 56.6 | -0.8907 | 0.5801 | 0.0201 | -32 | -90 |
| ϕ Sagittarii | 3.7 | 2.07 | 4.6 | 27 6.2 | 12 7 1.0 | -0 11.0 | +0.7189 | 0.5830 | -0.0003 | +62 | -1 |
| σ Sagittarii | 2.3 | +2.11 | -3.9 | -26 26.0 | 10 50.6 | +3 29.5 | +0.0465 | 0.5849 | +0.0182 | +18 | -39 |
| ψ Sagittarii | 5.4 | 2.22 | 2.4 | 25 26.6 | 18 51.1 | +11 10.9 | -0.7927 | 0.5879 | 0.0339 | -25 | -90 |
| B. A. C. 6666 | 5.8 | 2.35 | 2.1 | 27 12.4 | 13 0 25.9 | -7 27.5 | +1.2583 | 0.5888 | 0.0502 | +63 | +51 |
| λ^1 Sagittarii <i>var.</i> | 6.0 | 2.33 | 1.1 | 24 57.5 | 2 53.0 | -5 6.3 | -0.9164 | 0.5888 | 0.0573 | -30 | -90 |
| λ^2 Sagittarii | 4.6 | 2.32 | 1.0 | 25 7.4 | 3 8.5 | -4 51.5 | -0.7345 | 0.5888 | 0.0583 | -20 | -90 |
| ω Sagittarii | 5.1 | +2.45 | -0.3 | -26 35.3 | 10 34.5 | +2 16.6 | +1.2670 | 0.5895 | +0.0797 | +63 | +52 |
| γ Capricorni | 5.4 | 2.65 | +5.8 | 21 37.3 | 14 15 9.6 | +5 43.3 | -0.3019 | 0.5868 | 0.1584 | +13 | -61 |
| 27 Capricorni | 6.5 | 2.63 | 6.0 | 20 59.5 | 15 33.2 | +6 6.0 | -0.8752 | 0.5868 | 0.1592 | -18 | -90 |
| ϕ Capricorni | 5.5 | 2.65 | 6.3 | 21 6.2 | 17 58.1 | +8 25.2 | -0.3704 | 0.5854 | 0.1653 | +10 | -65 |
| 33 Capricorni | 5.7 | 2.66 | 6.8 | 21 18.3 | 21 21.6 | +11 40.7 | +0.4129 | 0.5848 | 0.1736 | +53 | -20 |
| 35 Capricorni | 6.2 | +2.69 | +6.9 | -21 39.9 | 22 35.3 | -11 8.6 | +0.9767 | 0.5835 | +0.1764 | +68 | +14 |
| 37 Capricorni | 6.0 | 2.69 | 7.6 | 20 34.1 | 15 1 38.6 | -8 12.3 | +0.4364 | 0.5825 | 0.1835 | +55 | -19 |
| ϵ Capricorni | 4.7 | 2.68 | 8.0 | 19 57.2 | 2 32.6 | -7 20.5 | -0.0066 | 0.5825 | 0.1857 | +31 | -43 |
| κ Capricorni | 5.0 | 2.68 | 6.5 | 19 21.5 | 4 47.0 | -5 11.3 | -0.1749 | 0.5826 | 0.1905 | +23 | -52 |
| B. A. C. 7550 | 6.3 | 2.69 | 8.3 | 20 6.9 | 5 0.4 | -4 58.4 | +0.6170 | 0.5812 | 0.1911 | +66 | -9 |
| 29 Aquarii <i>mult.</i> | 6.5 | +2.69 | +10.0 | -17 29.1 | 12 48.4 | +2 31.5 | -0.4260 | 0.5784 | +0.2078 | +12 | -69 |
| 56 Aquarii | 6.3 | 2.68 | 12.0 | 15 8.3 | 16 0 15.4 | -10 27.5 | -0.2308 | 0.5738 | 0.2290 | +24 | -56 |
| γ^1 Aquarii <i>mult.</i> | 5.8 | 2.68 | 13.1 | 14 37.6 | 7 30.4 | -3 28.8 | +0.9705 | 0.5710 | 0.2407 | +75 | +11 |
| γ^2 Aquarii | 4.1 | 2.68 | 13.2 | 14 9.9 | 8 17.9 | -2 43.1 | +0.7074 | 0.5710 | 0.2407 | +76 | -3 |
| 74 Aquarii | 6.0 | 2.66 | 13.6 | 12 11.6 | 9 56.2 | -1 8.5 | -0.8268 | 0.5703 | 0.2444 | -6 | -90 |
| ψ^1 Aquarii | 4.1 | +2.64 | +14.8 | -9 40.6 | 19 23.8 | +7 58.2 | -0.9170 | 0.5658 | +0.2562 | -10 | -90 |
| ψ^2 Aquarii | 4.2 | 2.64 | 14.5 | 9 46.5 | 20 16.3 | +8 48.8 | -0.5944 | 0.5658 | 0.2572 | +9 | -81 |
| ψ^3 Aquarii | 4.8 | 2.65 | 14.9 | 10 12.2 | 20 43.0 | +9 14.5 | -0.0619 | 0.5658 | 0.2577 | +36 | -46 |
| 14 Ceti | 6.0 | 2.54 | 17.3 | -1 6.0 | 18 5 53.9 | -6 45.8 | +0.0099 | 0.5564 | 0.2767 | +43 | -42 |
| f Piscium | 5.1 | 2.46 | 17.3 | +3 2.7 | 19 0 29.6 | +11 10.7 | +1.0770 | 0.5551 | 0.2728 | +90 | +18 |
| μ Piscium | 5.0 | +2.44 | +17.2 | +5 35.1 | 5 54.8 | -7 35.5 | +0.0525 | 0.5552 | +0.2696 | +45 | -38 |
| σ Piscium | 4.4 | 2.42 | 16.8 | 8 36.9 | 12 35.7 | -1 8.6 | -1.1440 | 0.5551 | 0.2643 | -23 | -81 |
| α Arietis | 6.0 | 2.31 | 14.6 | 14 51.3 | 20 14 22.1 | -0 16.9 | -0.8884 | 0.5594 | 0.2345 | -6 | -75 |
| σ Arietis | 5.5 | 2.29 | 14.5 | 14 38.2 | 17 21.3 | +2 35.8 | +0.0234 | 0.5602 | 0.2298 | +44 | -35 |
| 13 Tauri | 5.7 | 2.17 | 11.9 | 19 21.2 | 21 15 0.7 | -0 31.7 | -0.1625 | 0.5649 | 0.1903 | +33 | -41 |
| 14 Tauri | 6.3 | +2.16 | +11.8 | +19 19.4 | 15 37.8 | +0 4.0 | -0.0151 | 0.5649 | +0.1890 | +41 | -33 |
| B. A. C. 1143 | 6.0 | +2.17 | +11.4 | +20 35.2 | 15 54.1 | +0 19.7 | -1.2470 | 0.5649 | +0.1886 | -38 | -69 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | | Limiting Parallels. | |
|--------------------------------|------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|---------|-----|------------------------|--|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. | |
| | | $\Delta\alpha$ | $\Delta\delta$ | | | | | | | | | |
| B. A. C. 1242 | 6.3 | +2.11 | +11.2 | +19 53.8 | 21 22 55.9 | + 7 6.0 | +0.7261 | 0.5663 | +0.1735 | +90 | + 8 | |
| A ¹ Tauri | 4.7 | 2.11 | 10.5 | 21 47.2 | 22 0 24.0 | + 8 30.8 | -0.9506 | 0.5663 | 0.1702 | -12 | -68 | |
| A ² Tauri | 6.3 | 2.11 | 10.5 | 21 43.1 | 0 39.9 | + 8 46.2 | -0.8364 | 0.5670 | 0.1698 | - 5 | -68 | |
| 51 Tauri | 6.0 | 2.06 | 10.0 | 21 19.0 | 6 8.8 | - 9 57.0 | +0.4720 | 0.5683 | 0.1573 | +73 | - 5 | |
| 53 Tauri | 6.0 | 2.05 | 10.2 | 20 52.9 | 6 35.7 | - 9 31.2 | +0.9663 | 0.5681 | 0.1561 | +90 | +25 | |
| 56 Tauri | 6.0 | +2.06 | +10.1 | +21 30.8 | 6 39.4 | - 9 27.6 | +0.3487 | 0.5683 | +0.1561 | +64 | -11 | |
| κ^1 Tauri | 4.7 | 2.04 | 9.7 | 22 2.8 | 9 2.9 | - 7 9.5 | +0.1712 | 0.5690 | 0.1507 | +52 | -20 | |
| κ^2 Tauri | 6.3 | 2.04 | 9.7 | 21 57.2 | 9 4.3 | - 7 8.1 | +0.2705 | 0.5690 | 0.1507 | +59 | -15 | |
| ν^1 Tauri | 4.7 | 2.05 | 9.3 | 22 34.1 | 9 25.9 | - 6 47.3 | -0.3098 | 0.5688 | 0.1495 | +25 | -45 | |
| ν^2 Tauri | 6.0 | 2.05 | 9.2 | 22 45.2 | 9 50.7 | - 6 23.4 | -0.4383 | 0.5688 | 0.1486 | +18 | -52 | |
| B. A. C. 1373 | 6.0 | +2.02 | + 9.8 | +21 22.6 | 10 10.0 | - 6 4.8 | +1.0260 | 0.5685 | +0.1477 | +90 | +29 | |
| τ Tauri | 4.5 | 1.99 | 8.7 | 22 45.1 | 16 4.3 | - 0 23.7 | +0.4424 | 0.5703 | 0.1338 | +71 | - 4 | |
| 95 Tauri | 6.3 | 2.00 | 8.3 | 23 53.1 | 16 27.4 | - 0 1.4 | -0.6747 | 0.5703 | 0.1327 | + 4 | -65 | |
| 99 Tauri | 6.0 | 1.95 | 7.6 | 23 46.7 | 22 30.9 | + 5 48.5 | +0.1918 | 0.5699 | 0.1176 | +56 | -15 | |
| k Tauri | 6.0 | 1.98 | 7.4 | 24 53.0 | 22 38.0 | + 5 55.3 | -0.9380 | 0.5698 | 0.1175 | -13 | -65 | |
| 103 Tauri | 6.0 | +1.90 | + 7.3 | +24 7.3 | 23 2 46.5 | + 9 54.5 | +0.3154 | 0.5707 | +0.1068 | +62 | - 8 | |
| 118 Tauri | 5.7 | 1.82 | 6.0 | 25 3.8 | 11 31.2 | - 5 40.5 | +0.1689 | 0.5706 | 0.0841 | +53 | -13 | |
| 125 Tauri | 6.0 | 1.80 | 5.3 | 25 50.3 | 15 49.9 | - 1 31.5 | -0.3024 | 0.5706 | 0.0727 | +25 | -37 | |
| 139 Tauri | 5.3 | 1.72 | 4.5 | 25 56.5 | 23 24.2 | + 5 45.8 | +0.0633 | 0.5706 | +0.0528 | +46 | -16 | |
| 37 Geminorum | 6.3 | 1.43 | 2.6 | 25 30.7 | 24 23 26.2 | + 4 54.4 | +1.0320 | 0.5645 | -0.0107 | +90 | +42 | |
| 39 Geminorum | 6.3 | +1.42 | + 2.2 | +26 13.4 | 25 0 54.4 | + 6 19.3 | +0.2554 | 0.5645 | -0.0143 | +58 | - 2 | |
| 40 Geminorum | 6.3 | 1.42 | 2.2 | 26 3.8 | 1 11.2 | + 6 35.6 | +0.4215 | 0.5645 | 0.0152 | +70 | + 7 | |
| 47 Geminorum | 6.0 | 1.35 | 1.5 | 27 2.1 | 6 15.4 | +11 28.7 | -0.7300 | 0.5620 | 0.0279 | 0 | -63 | |
| A Geminorum | 5.7 | 1.29 | 1.6 | 25 15.5 | 11 30.1 | - 7 27.9 | +0.9963 | 0.5592 | 0.0412 | +90 | +37 | |
| c Geminorum | 6.0 | 1.20 | 0.6 | 26 2.6 | 20 28.4 | + 1 11.1 | -0.3171 | 0.5551 | 0.0630 | +24 | -37 | |
| κ Geminor. <i>mult.</i> | 3.6 | +1.18 | + 1.1 | +24 39.6 | 20 38.9 | + 1 21.3 | +1.1690 | 0.5551 | -0.0633 | +90 | +49 | |
| ω^1 Cancri | 6.0 | 1.11 | 0.3 | 25 41.4 | 26 3 55.3 | + 8 22.5 | -0.4684 | 0.5513 | 0.0804 | +16 | -48 | |
| ω^2 Cancri | 6.3 | 1.11 | + 0.3 | 25 23.4 | 4 17.1 | + 8 43.4 | -0.1718 | 0.5513 | 0.0811 | +32 | -31 | |
| ψ^1 Cancri | 5.7 | 1.07 | - 0.1 | 25 50.3 | 8 11.4 | -11 30.3 | -0.9963 | 0.5489 | 0.0897 | -18 | -64 | |
| λ Cancri | 5.7 | 1.01 | + 0.1 | 24 21.9 | 12 46.5 | - 7 4.7 | +0.1724 | 0.5464 | 0.1000 | +53 | -15 | |
| ν^1 Cancri <i>mult.</i> | 6.0 | +0.99 | - 0.3 | +24 53.5 | 15 33.5 | - 4 23.3 | -0.6892 | 0.5449 | -0.1060 | + 3 | -64 | |
| ν^2 Cancri | 5.8 | 0.97 | 0.2 | 24 30.3 | 16 27.6 | - 3 31.1 | -0.3636 | 0.5443 | 0.1070 | +22 | -45 | |
| ν^3 Cancri | 6.0 | 0.94 | 0.3 | 24 26.9 | 17 47.7 | - 2 13.6 | -0.4473 | 0.5433 | 0.1106 | +17 | -49 | |
| ν^4 Cancri | 5.7 | 0.96 | 0.4 | 24 27.3 | 18 28.7 | - 1 34.0 | -0.5309 | 0.5428 | 0.1120 | +13 | -55 | |
| ξ Cancri | 5.0 | 0.78 | 0.8 | 22 29.2 | 27 11 35.6 | - 9 0.8 | -0.5861 | 0.5328 | 0.1453 | +10 | -61 | |
| 79 Cancri | 6.3 | +0.78 | - 0.8 | +22 26.3 | 12 4.2 | - 8 33.1 | -0.6008 | 0.5326 | -0.1460 | + 9 | -62 | |
| B. A. C. 3138 | 6.3 | 0.76 | 0.7 | 21 43.9 | 13 39.4 | - 7 1.0 | -0.0605 | 0.5315 | 0.1488 | +39 | -32 | |
| B. A. C. 3206 | 6.3 | 0.70 | 0.5 | 20 15.5 | 19 5.4 | - 1 45.3 | +0.7285 | 0.5277 | 0.1580 | +90 | + 8 | |
| η Leonis | 3.3 | 0.51 | 0.8 | 17 17.6 | 28 16 26.5 | - 5 3.5 | +0.2804 | 0.5156 | 0.1899 | +59 | -20 | |
| 42 Leonis | 6.0 | 0.45 | 0.7 | 15 31.5 | 23 58.1 | + 2 14.8 | +0.7767 | 0.5110 | 0.1990 | +90 | + 6 | |
| i Leonis | 5.7 | +0.41 | - 0.7 | +14 41.8 | 29 5 24.4 | + 7 31.5 | +0.5971 | 0.5088 | -0.2054 | +82 | - 6 | |
| k Leonis | 5.7 | 0.38 | 1.0 | 14 46.2 | 12 58.1 | - 9 7.7 | -1.0670 | 0.5046 | 0.2130 | -18 | -75 | |
| ν Virginis | 4.0 | +0.21 | - 1.0 | + 7 8.4 | 30 21 35.3 | - 1 24.9 | +0.0297 | 0.4944 | -0.2371 | +44 | -39 | |

OCTOBER.

| | | | | NEW | MOON. | | | | | | |
|-------------------|-----|-------|-------|----------|----------|----------|---------|--------|---------|-----|-----|
| κ Virginis | 4.2 | +0.19 | - 3.8 | - 9 46.1 | 4 7 43.7 | + 6 30.3 | -1.0020 | 0.5018 | -0.2288 | -15 | -90 |
| 2 Libræ | 6.5 | 0.21 | 4.1 | 11 13.1 | 13 21.6 | +11 58.6 | -0.6784 | 0.5047 | 0.2247 | + 4 | -90 |
| 5 Libræ | 6.6 | +0.25 | - 5.0 | -15 0.1 | 5 1 11.7 | - 0 31.8 | +0.8902 | 0.5099 | -0.2140 | +75 | + 6 |
| μ Libræ | 5.7 | 0.27 | 4.7 | 13 41.7 | 2 57.6 | + 1 11.1 | -0.9212 | 0.5116 | 0.2121 | -12 | -90 |
| α^1 Libræ | 6.3 | 0.27 | 5.1 | 15 32.7 | 3 38.6 | + 1 50.8 | +0.9654 | 0.5121 | 0.2113 | +74 | +11 |
| α^2 Libræ | 2.9 | 0.28 | 5.1 | 15 35.4 | 3 44.6 | + 1 56.7 | +0.9947 | 0.5121 | 0.2113 | +74 | +13 |
| ν^1 Libræ | 5.5 | 0.32 | 5.3 | 15 50.1 | 11 49.2 | + 9 47.0 | -0.4059 | 0.5169 | 0.2024 | +15 | -67 |
| ν^2 Libræ | 6.9 | +0.32 | - 5.4 | -16 3.8 | 11 54.9 | + 9 52.5 | -0.1773 | 0.5169 | -0.2024 | +26 | -52 |
| 28 Libræ | 6.0 | +0.37 | - 5.8 | -17 45.9 | 18 58.7 | - 7 16.6 | +0.2878 | 0.5200 | -0.1933 | +53 | -27 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | | Limiting Parallels. | |
|-------------------------------|------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|---------|-----|------------------------|--|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. | |
| | | $\Delta\alpha$ | $\Delta\delta$ | | | | | | | | | |
| ζ^3 Libræ | 7.0 | +0.41 | -5.6 | -17° 4.0 | d h m 5 23 18.8 | h m - 3 4.4 | -1.2085 | 0.5236 | -0.1876 | -49 | -90 | |
| B. A. C. 5109 | 6.2 | 0.41 | 6.1 | 19 18.1 | 6 0 46.0 | - 1 40.0 | +0.8726 | 0.5246 | 0.1857 | +71 | + 6 | |
| 41 Libræ | 5.9 | 0.45 | 6.2 | 18 56.6 | 3 51.3 | + 1 19.6 | -0.0873 | 0.5265 | 0.1809 | +28 | -47 | |
| κ Libræ | 5.1 | 0.46 | 6.2 | 19 19.6 | 5 20.2 | + 2 45.6 | +0.0818 | 0.5276 | 0.1790 | +37 | -38 | |
| λ Libræ | 5.1 | 0.51 | 6.3 | 19 50.5 | 10 49.9 | + 8 4.9 | -0.3339 | 0.5313 | 0.1702 | +15 | -63 | |
| ω^1 Scorpii | 4.6 | +0.58 | - 6.4 | -20 22.5 | 17 14.0 | - 9 43.1 | -0.8084 | 0.5348 | -0.1595 | -13 | -90 | |
| ω^2 Scorpii | 4.6 | 0.58 | 6.5 | 20 34.5 | 17 30.4 | - 9 27.3 | -0.6328 | 0.5354 | 0.1590 | - 3 | -88 | |
| ρ Ophiuchi <i>mult.</i> | 5.0 | 0.68 | 7.1 | 23 11.8 | 7 1 56.2 | - 1 18.3 | +0.5855 | 0.5412 | 0.1436 | +67 | +10 | |
| 18 Ophiuchi | 6.7 | 0.83 | 7.2 | 24 27.0 | 12 53.8 | + 9 17.0 | +0.8220 | 0.5487 | 0.1219 | +66 | + 5 | |
| 22 Ophiuchi | 6.7 | 0.86 | 6.8 | 23 20.0 | 15 12.4 | +11 30.8 | -0.6577 | 0.5499 | 0.1168 | - 9 | -90 | |
| 24 Ophiuchi | 6.0 | +0.87 | - 6.7 | -22 58.7 | 16 4.9 | -11 38.5 | -1.1390 | 0.5508 | -0.1152 | -41 | -90 | |
| B. A. C. 5709 | 6.3 | 0.89 | 7.2 | 24 55.6 | 17 26.7 | -10 19.5 | +0.7992 | 0.5521 | 0.1122 | +65 | + 3 | |
| 26 Ophiuchi | 6.1 | 0.89 | 7.2 | 24 49.5 | 17 31.8 | -10 14.6 | +0.6810 | 0.5521 | 0.1120 | +64 | - 4 | |
| 39 Ophiuchi <i>mult.</i> | 5.5 | 0.97 | 6.7 | 24 10.2 | 8 1 23.8 | - 2 39.2 | -0.8322 | 0.5573 | 0.0945 | -21 | -90 | |
| B. A. C. 5831 | 6.5 | 1.00 | 6.7 | 23 57.2 | 1 26.4 | - 2 36.7 | -1.0680 | 0.5563 | 0.0939 | -37 | -90 | |
| θ Ophiuchi | 3.3 | +1.03 | - 6.9 | -24 53.6 | 3 6.9 | - 0 59.8 | -0.2125 | 0.5526 | -0.0903 | +11 | -56 | |
| B. A. C. 6194 | 5.1 | 1.40 | 6.4 | 27 5.0 | 9 2 47.7 | - 2 11.0 | +0.6602 | 0.5702 | 0.0298 | +58 | - 5 | |
| λ Sagittarii | 2.9 | 1.45 | 5.5 | 25 28.9 | 6 56.1 | + 1 48.1 | -1.1330 | 0.5725 | 0.0198 | -49 | -90 | |
| ϕ Sagittarii | 3.7 | 1.58 | 5.2 | 27 6.2 | 14 9.1 | + 8 44.7 | +0.5025 | 0.5753 | -0.0002 | +44 | -14 | |
| σ Sagittarii | 2.3 | 1.63 | 4.6 | 26 26.0 | 18 5.2 | -11 28.2 | -0.1797 | 0.5754 | +0.0106 | + 6 | -53 | |
| ψ Sagittarii | 5.4 | +1.74 | - 3.3 | -25 26.6 | 10 2 19.9 | - 3 32.6 | -1.0280 | 0.5785 | +0.0339 | -40 | -90 | |
| B. A. C. 6666 | 5.8 | 1.86 | 3.3 | 27 12.4 | 8 5.2 | + 1 59.5 | +1.0500 | 0.5791 | 0.0500 | +63 | +23 | |
| Λ^2 Sagittarii | 4.6 | 1.87 | 2.1 | 25 7.4 | 10 53.0 | + 4 40.7 | -0.9636 | 0.5794 | 0.0579 | -33 | -90 | |
| ω Sagittarii | 5.1 | 2.01 | 1.7 | 26 35.3 | 18 33.7 | -11 56.4 | +1.0770 | 0.5794 | 0.0792 | +63 | +25 | |
| A Sagittarii | 5.3 | 2.02 | - 1.5 | 26 29.4 | 19 49.8 | +10 43.2 | +1.0790 | 0.5798 | 0.0827 | +64 | +25 | |
| χ Capricorni | 5.4 | +2.32 | + 3.9 | -21 37.8 | 12 0 8.6 | - 7 29.8 | -0.4872 | 0.5757 | +0.1565 | +4 | -74 | |
| 27 Capricorni | 6.5 | 2.32 | 4.1 | 20 59.5 | 0 33.1 | - 7 6.2 | -1.0710 | 0.5749 | 0.1573 | -32 | -90 | |
| ϕ Capricorni | 5.5 | 2.35 | 4.5 | 21 6.2 | 3 3.0 | - 4 42.0 | -0.5546 | 0.5738 | 0.1632 | + 1 | -80 | |
| 33 Capricorni | 5.7 | 2.39 | 4.9 | 21 18.8 | 6 33.7 | - 1 19.3 | +0.2458 | 0.5729 | 0.1716 | +43 | -29 | |
| 35 Capricorni | 6.2 | 2.39 | 4.9 | 21 39.8 | 7 49.9 | - 0 6.0 | +0.8198 | 0.5729 | 0.1746 | +68 | + 3 | |
| 37 Capricorni | 6.0 | +2.42 | + 5.7 | -20 34.0 | 10 59.6 | + 2 56.6 | +0.2739 | 0.5720 | +0.1818 | +45 | -28 | |
| ϵ Capricorni | 4.7 | 2.42 | 6.1 | 19 57.1 | 11 55.4 | + 3 50.3 | -0.1745 | 0.5711 | 0.1836 | +22 | -53 | |
| κ Capricorni | 5.0 | 2.43 | 6.6 | 19 21.5 | 14 14.4 | + 6 4.1 | -0.3423 | 0.5711 | 0.1886 | +15 | -63 | |
| B. A. C. 7550 | 6.3 | 2.44 | 6.4 | 20 6.9 | 14 28.3 | + 6 17.5 | +0.4639 | 0.5703 | 0.1891 | +57 | -17 | |
| 29 Aquarii <i>mult.</i> | 6.5 | 2.48 | 8.2 | 17 29.1 | 22 31.8 | - 9 57.1 | -0.5843 | 0.5679 | 0.2057 | + 4 | -82 | |
| 56 Aquarii | 6.3 | +2.54 | +10.5 | -15 8.3 | 13 10 20.3 | + 1 25.5 | -0.3654 | 0.5653 | +0.2274 | +17 | -64 | |
| τ^1 Aquarii <i>mult.</i> | 5.8 | 2.59 | 11.6 | 14 37.6 | 17 47.8 | + 8 36.7 | +0.8662 | 0.5619 | 0.2389 | +75 | + 4 | |
| τ^2 Aquarii | 4.1 | 2.59 | 11.8 | 14 9.9 | 18 36.7 | + 9 23.8 | +0.6017 | 0.5619 | 0.2402 | +72 | -11 | |
| 74 Aquarii | 6.0 | 2.58 | 12.4 | 12 11.6 | 20 17.7 | +11 1.2 | -0.9453 | 0.5618 | 0.2428 | -13 | -90 | |
| ψ^1 Aquarii | 4.1 | 2.61 | 13.9 | 9 40.6 | 14 5 59.4 | - 3 38.0 | -1.0160 | 0.5584 | 0.2549 | -16 | -90 | |
| ψ^2 Aquarii | 4.2 | +2.61 | +14.0 | - 9 46.5 | 6 53.0 | - 2 46.4 | -0.6923 | 0.5584 | +0.2561 | + 4 | -90 | |
| ψ^3 Aquarii | 4.8 | 2.62 | 14.0 | 10 12.2 | 7 20.5 | - 2 19.8 | -0.1516 | 0.5585 | 0.2565 | +32 | -51 | |
| B. A. C. 8274 | 7.0 | 2.65 | 15.7 | 6 58.9 | 20 17.7 | +10 9.9 | +0.0836 | 0.5564 | 0.2688 | +46 | -38 | |
| 14 Ceti | 6.0 | 2.70 | 17.7 | 1 6.0 | 15 17 1.0 | + 6 9.5 | -0.0016 | 0.5546 | 0.2781 | +42 | -43 | |
| 15 Ceti | 6.8 | 2.70 | 17.8 | - 1 6.0 | 18 8.6 | + 7 14.8 | +0.3105 | 0.5546 | 0.2782 | +60 | -26 | |
| f Piscium | 5.1 | +2.73 | +18.4 | + 3 2.7 | 16 11 39.7 | + 0 8.1 | +1.1060 | 0.5560 | +0.2753 | +90 | +20 | |
| μ Piscium | 5.0 | 2.74 | 18.5 | 5 35.1 | 17 2.6 | + 5 20.6 | +0.0966 | 0.5578 | 0.2731 | +48 | -36 | |
| σ Piscium | 4.4 | 2.77 | 18.5 | 8 36.9 | 23 40.5 | +11 44.5 | -1.0830 | 0.5582 | 0.2681 | -18 | -81 | |
| σ Arietis | 5.5 | 2.82 | 16.7 | 14 38.2 | 18 3 58.9 | - 8 58.4 | +0.1372 | 0.5667 | 0.2342 | +50 | -30 | |
| 13 Tauri | 5.7 | 2.84 | 14.1 | 19 21.3 | 19 1 5.6 | +11 21.3 | -0.9184 | 0.5732 | 0.1945 | +41 | -33 | |
| 14 Tauri | 6.3 | +2.83 | +14.2 | +19 19.5 | 1 41.5 | +11 55.8 | +0.1271 | 0.5738 | +0.1935 | +50 | -25 | |
| B. A. C. 1143 | 6.0 | 2.82 | 13.8 | 20 35.3 | 1 57.3 | -11 49.0 | -1.0900 | 0.5738 | 0.1930 | -22 | -60 | |
| B. A. C. 1242 | 6.3 | 2.82 | 13.2 | 19 53.8 | 8 46.5 | - 5 15.4 | +0.8708 | 0.5758 | 0.1777 | +90 | +16 | |
| A ¹ Tauri | 4.7 | 2.85 | 12.7 | 21 47.2 | 10 12.3 | - 3 52.8 | -0.7818 | 0.5758 | 0.1740 | - 1 | -68 | |
| A ² Tauri | 6.3 | 2.84 | 12.6 | 21 43.1 | 10 27.7 | - 3 38.0 | -0.6688 | 0.5767 | 0.1738 | + 6 | -67 | |
| 51 Tauri | 6.0 | +2.81 | +12.0 | +21 19.0 | 15 46.4 | + 1 28.6 | +0.6272 | 0.5778 | +0.1611 | +88 | + 4 | |
| 56 Tauri | 6.0 | +2.81 | +11.9 | +21 30.8 | 16 16.2 | + 1 57.2 | +0.5075 | 0.5778 | +0.1599 | +76 | - 3 | |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | Limiting Parallels. | |
|-------------------|------|---------------------|----------------|-----------------------|-------------------------|--------------|---------|--------|---------|---------------------|-----|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. |
| | | $\Delta\alpha$ | $\Delta\delta$ | | d h m | h m | | | | | |
| α^1 Tauri | 4.7 | +2.80 | +11.5 | +22 2.8 | 19 18 35.2 | + 4 10.9 | +0.3294 | 0.5784 | +0.1544 | +63 | -11 |
| α^2 Tauri | 6.3 | 2.80 | 11.5 | 21 57.2 | 18 36.8 | + 4 12.5 | +0.4290 | 0.5784 | 0.1542 | +70 | - 6 |
| ν^1 Tauri | 4.7 | 2.81 | 11.3 | 22 34.1 | 18 57.4 | + 4 32.2 | -0.1402 | 0.5784 | 0.1534 | +35 | -35 |
| ν^2 Tauri | 6.0 | 2.82 | 11.2 | 22 45.2 | 19 21.3 | + 4 55.2 | -0.2685 | 0.5784 | 0.1524 | +28 | -42 |
| τ Tauri | 4.5 | 2.79 | 10.4 | 22 45.1 | 20 1 23.1 | +10 43.1 | +0.6067 | 0.5798 | 0.1368 | +86 | + 5 |
| 95 Tauri | 6.3 | +2.80 | +10.0 | +23 53.1 | 1 45.4 | +11 4.6 | -0.4958 | 0.5805 | +0.1360 | +15 | -54 |
| 99 Tauri | 6.0 | 2.77 | 9.2 | 23 46.8 | 7 37.1 | - 7 17.4 | +0.3646 | 0.5805 | 0.1203 | +65 | - 7 |
| k Tauri | 6.0 | 2.77 | 8.9 | 24 53.1 | 7 44.1 | - 7 10.7 | -0.7513 | 0.5805 | 0.1201 | 0 | -65 |
| 103 Tauri | 6.0 | 2.74 | 8.5 | 24 7.3 | 11 44.5 | - 3 19.6 | +0.4889 | 0.5808 | 0.1094 | +75 | + 1 |
| 118 Tauri | 5.7 | 2.69 | 6.9 | 25 3.8 | 20 12.1 | + 4 48.3 | +0.3522 | 0.5808 | 0.0863 | +65 | - 4 |
| 126 Tauri | 6.0 | +2.69 | + 5.9 | +25 50.3 | 21 0 22.5 | + 8 49.0 | -0.1120 | 0.5809 | +0.0745 | +36 | -27 |
| 139 Tauri | 5.3 | 2.61 | 4.7 | 25 56.5 | 7 42.4 | - 8 8.1 | +0.2530 | 0.5800 | +0.0542 | +58 | - 6 |
| 39 Geminorum | 6.3 | 2.36 | 1.4 | 26 13.4 | 22 8 27.9 | - 8 19.5 | +0.4455 | 0.5707 | -0.0146 | +72 | + 8 |
| 40 Geminorum | 6.3 | 2.35 | 1.4 | 26 3.8 | 8 44.4 | - 8 3.6 | +0.6109 | 0.5705 | 0.0155 | +88 | +16 |
| 47 Geminorum | 6.0 | 2.31 | + 0.1 | 27 2.1 | 13 40.6 | - 3 18.4 | -0.5247 | 0.5685 | 0.0284 | +13 | -47 |
| A Geminorum | 5.7 | +2.23 | - 0.1 | +25 15.5 | 18 47.4 | + 1 37.0 | +1.1845 | 0.5658 | -0.0418 | +90 | +52 |
| ν Geminorum | 4.3 | 2.19 | 1.4 | 27 8.2 | 23 0 1.7 | + 6 39.8 | -1.0730 | 0.5628 | 0.0552 | -25 | -63 |
| c Geminorum | 6.0 | 2.12 | 1.6 | 26 2.6 | 3 33.4 | +10 3.8 | -0.1159 | 0.5608 | 0.0640 | +36 | -26 |
| ω^1 Cancri | 6.0 | 2.02 | 2.4 | 25 41.4 | 10 51.0 | - 6 54.2 | -0.2683 | 0.5558 | 0.0814 | +27 | -36 |
| ω^2 Cancri | 6.3 | 2.01 | 2.4 | 25 23.4 | 11 12.5 | - 6 33.6 | +0.0933 | 0.5552 | 0.0821 | +44 | -21 |
| ψ^1 Cancri | 6.8 | +1.98 | - 3.1 | +26 9.9 | 14 55.5 | - 2 58.4 | -1.1330 | 0.5534 | -0.0908 | -30 | -64 |
| ψ^2 Cancri | 5.7 | 1.98 | 3.1 | 25 50.3 | 15 2.3 | - 2 51.9 | -0.7900 | 0.5531 | 0.0910 | - 3 | -64 |
| λ Cancri | 5.7 | 1.89 | 3.0 | 24 21.9 | 19 32.7 | + 1 29.1 | +0.3633 | 0.5494 | 0.1011 | +65 | - 5 |
| ν^1 Cancri | 6.0 | 1.87 | 3.5 | 24 53.5 | 22 17.1 | + 4 7.8 | -0.4900 | 0.5482 | 0.1082 | +15 | -52 |
| ν^2 Cancri | 5.8 | 1.85 | 3.5 | 24 30.3 | 23 10.2 | + 4 59.1 | -0.1675 | 0.5473 | 0.1090 | +33 | -33 |
| ν^3 Cancri | 6.0 | +1.83 | - 3.6 | +24 26.9 | 24 0 28.9 | + 6 15.1 | -0.2509 | 0.5466 | -0.1117 | +28 | -38 |
| ν^4 Cancri | 5.7 | 1.82 | 3.7 | 24 27.3 | 1 9.4 | + 6 54.2 | -0.3357 | 0.5462 | 0.1131 | +24 | -43 |
| ξ Cancri | 5.0 | 1.59 | 4.6 | 22 29.2 | 18 3.4 | - 0 45.5 | -0.3982 | 0.5340 | 0.1460 | +21 | -51 |
| 79 Cancri | 6.3 | 1.58 | 4.6 | 22 26.3 | 18 31.7 | - 0 18.1 | -0.4146 | 0.5334 | 0.1469 | +20 | -52 |
| B. A. C. 3138 | 6.3 | 1.55 | 4.5 | 21 43.9 | 20 6.0 | + 1 13.1 | +0.1237 | 0.5320 | 0.1496 | +50 | -23 |
| B. A. C. 3206 | 6.3 | +1.48 | - 4.4 | +20 15.5 | 25 1 29.0 | + 6 25.8 | +0.9034 | 0.5277 | -0.1589 | +90 | +18 |
| η Leonis | 3.3 | 1.21 | 5.0 | 17 17.5 | 22 43.1 | + 3 0.6 | +0.4460 | 0.5138 | 0.1901 | +70 | -11 |
| 42 Leonis | 6.0 | 1.11 | 4.9 | 15 31.4 | 26 6 13.7 | +10 17.8 | +0.9303 | 0.5097 | 0.1995 | +90 | +15 |
| i Leonis | 5.7 | 1.04 | 5.0 | 14 41.7 | 11 39.6 | - 8 25.8 | +0.7479 | 0.5071 | 0.2058 | +90 | + 3 |
| k Leonis | 5.7 | 0.99 | 5.3 | 14 46.1 | 19 13.1 | - 1 5.2 | -0.9189 | 0.5033 | 0.2135 | - 8 | -75 |
| ω Virginis | 5.9 | +0.71 | - 4.9 | + 8 44.2 | 27 23 44.5 | + 2 38.7 | -0.6612 | 0.4935 | -0.2354 | + 8 | -80 |
| ν Virginis | 4.0 | 0.65 | 4.7 | 7 8.3 | 28 3 53.1 | + 6 40.4 | +0.1352 | 0.4923 | 0.2376 | +50 | -34 |
| c Virginis | 5.5 | 0.54 | 4.8 | + 3 55.1 | 23 21.4 | + 1 37.4 | -0.9891 | 0.4904 | 0.2447 | -11 | -86 |
| 46 Virginis | 6.1 | 0.42 | 4.5 | - 2 47.0 | 29 22 5.5 | - 0 15.0 | +0.8541 | 0.4913 | 0.2465 | +87 | + 3 |
| 48 Virginis | 6.7 | +0.41 | - 4.5 | - 3 4.7 | 23 57.2 | + 1 33.8 | +0.7228 | 0.4918 | -0.2465 | +86 | - 5 |

NEW MOON.

NOVEMBER.

| | | | | | | | | | | | |
|--------------------|-----|-------|-------|----------|----------|----------|---------|--------|---------|-----|-----|
| VENUS | | | | -18 2.0 | 2 2 23.6 | + 1 53.0 | +0.2314 | 0.4711 | -0.1776 | +47 | -30 |
| ω^1 Scorpii | 4.6 | +0.44 | - 5.9 | 20 22.5 | 22 57.6 | - 2 12.3 | -0.8614 | 0.5230 | 0.1569 | -16 | -90 |
| ω^2 Scorpii | 4.6 | 0.44 | 5.9 | 20 34.5 | 23 14.1 | - 1 56.4 | -0.6929 | 0.5234 | 0.1565 | - 6 | -90 |
| ρ Ophiuchi | 5.0 | 0.50 | 6.2 | 23 11.8 | 3 7 35.7 | + 6 8.6 | +0.8164 | 0.5287 | 0.1410 | +67 | + 4 |
| 18 Ophiuchi | 6.7 | 0.59 | 6.3 | 24 27.0 | 18 28.8 | - 7 20.6 | +0.7073 | 0.5352 | 0.1197 | +65 | - 3 |
| 22 Ophiuchi | 6.7 | +0.61 | - 6.1 | -23 20.0 | 20 46.5 | - 5 7.7 | -0.7286 | 0.5362 | -0.1147 | -13 | -90 |
| B. A. C. 5709 | 6.3 | 0.63 | 6.4 | 24 55.6 | 23 0.3 | - 2 58.6 | +0.6833 | 0.5380 | 0.1147 | +64 | - 4 |
| 26 Ophiuchi | 6.1 | 0.63 | 6.4 | 24 49.5 | 23 5.3 | - 2 53.8 | +0.5688 | 0.5380 | 0.1099 | +57 | -11 |
| 39 Ophiuchi | 5.5 | 0.71 | 6.1 | 24 10.2 | 4 6 55.2 | + 4 39.5 | -0.9097 | 0.5432 | 0.0927 | -26 | -90 |
| B. A. C. 5831 | 6.5 | 0.71 | 6.1 | 23 57.2 | 6 57.8 | + 4 42.0 | -1.1390 | 0.5432 | 0.0925 | -43 | -90 |
| θ Ophiuchi | 3.3 | +0.73 | - 6.2 | -24 53.6 | 8 38.0 | + 6 18.7 | -0.3102 | 0.5434 | -0.0886 | + 7 | -62 |
| B. A. C. 6194 | 5.1 | +1.01 | - 6.0 | -27 5.0 | 5 8 18.8 | + 5 7.5 | +0.5370 | 0.5547 | -0.0290 | +48 | -12 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | Limiting Parallels. | |
|-------------------------------|------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|---------|------------------------|------|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. |
| | | $\Delta\alpha$ | $\Delta\delta$ | | d h m | h m | | | | | |
| λ Sagittarii | 2.9 | +1.06 | - 5.3 | -25° 28.9 | 5 12 28.1 | + 9 7.5 | -1.2180 | 0.5563 | -0.0196 | -57° | -90° |
| ϕ Sagittarii | 3.7 | 1.17 | 5.1 | 27 6.2 | 19 43.8 | - 7 53.2 | +0.3790 | 0.5585 | -0.0003 | +35 | -21 |
| σ Sagittarii | 2.3 | 1.92 | 4.7 | 26 26.0 | 23 41.8 | - 4 4.3 | -0.2894 | 0.5593 | +0.0103 | 0 | -61 |
| τ Sagittarii | 3.6 | 1.30 | 5.3 | 27 49.7 | 6 4 27.7 | + 0 30.8 | +1.2260 | 0.5610 | 0.0231 | +62 | +44 |
| ψ Sagittarii | 5.4 | 1.32 | 3.7 | 25 26.7 | 8 1.6 | + 3 56.5 | -1.1260 | 0.5614 | 0.0326 | -48 | -90 |
| B. A. C. 6666 | 5.8 | +1.42 | - 3.8 | -27 12.5 | 13 51.4 | + 9 33.1 | +0.9179 | 0.5616 | +0.0484 | +63 | +12 |
| Λ Sagittarii | 4.6 | 1.44 | 2.8 | 25 7.4 | 16 41.7 | -11 43.2 | -1.0680 | 0.5623 | 0.0560 | -41 | -90 |
| ω Sagittarii | 5.1 | 1.58 | 2.6 | 26 35.3 | 7 0 29.9 | - 4 12.8 | -0.9506 | 0.5626 | 0.0766 | +63 | +14 |
| A Sagittarii | 5.3 | 1.59 | - 2.5 | 26 29.4 | 1 47.3 | - 2 58.3 | +0.9506 | 0.5620 | 0.0801 | +64 | +14 |
| χ Capricorni | 5.4 | 1.91 | + 2.2 | 21 37.8 | 8 6 47.2 | + 0 56.4 | -0.6030 | 0.5582 | 0.1521 | - 3 | -85 |
| 27 Capricorni | 6.5 | +1.89 | + 2.4 | -20 59.5 | 7 12.4 | + 1 20.6 | -1.1860 | 0.5578 | +0.1529 | -41 | -90 |
| ϕ Capricorni | 5.5 | 1.83 | 2.7 | 21 6.2 | 9 46.8 | + 3 49.4 | -0.6705 | 0.5577 | 0.1590 | - 6 | -90 |
| 33 Capricorni | 5.7 | 1.97 | 3.0 | 21 18.8 | 13 23.9 | + 7 18.5 | +0.1335 | 0.5569 | 0.1671 | +37 | -35 |
| 35 Capricorni | 6.2 | 2.00 | 3.0 | 21 39.9 | 14 42.5 | + 8 34.2 | +0.7082 | 0.5562 | 0.1698 | +68 | - 3 |
| 37 Capricorni | 6.0 | 2.02 | 3.8 | 20 34.1 | 17 58.2 | +11 42.8 | +0.1653 | 0.5556 | 0.1769 | +40 | -33 |
| κ Capricorni | 5.0 | +2.05 | + 4.7 | -19 21.6 | 21 19.4 | - 9 3.3 | -0.4526 | 0.5555 | +0.1840 | + 9 | -71 |
| B. A. C. 7550 | 6.3 | 2.06 | 4.5 | 20 7.0 | 21 33.7 | - 8 49.5 | +0.3575 | 0.5554 | 0.1847 | +52 | -23 |
| 29 Aquarii <i>mult.</i> | 6.5 | 2.13 | 6.3 | 17 29.2 | 9 5 53.8 | - 0 47.4 | -0.6952 | 0.5530 | 0.2008 | - 2 | -90 |
| 53 Aquarii <i>mult.</i> | 5.8 | 2.23 | 7.5 | 17 17.6 | 16 27.9 | + 9 24.2 | +1.3330 | 0.5513 | 0.2197 | +73 | +48 |
| 56 Aquarii | 6.3 | 2.23 | 8.4 | 15 8.3 | 18 7.9 | +11 0.7 | -0.4706 | 0.5511 | 0.2223 | +12 | -72 |
| τ^1 Aquarii <i>mult.</i> | 5.8 | +2.29 | + 9.4 | -14 37.6 | 10 1 52.3 | - 5 31.0 | +0.7802 | 0.5493 | +0.2342 | +69 | - 1 |
| τ^2 Aquarii | 4.1 | 2.30 | 9.6 | 14 9.9 | 2 43.0 | - 4 42.1 | +0.5135 | 0.5491 | 0.2356 | +66 | -16 |
| 74 Aquarii | 6.0 | 2.29 | 10.4 | 12 11.6 | 4 27.7 | - 3 1.0 | -1.0570 | 0.5489 | 0.2381 | -20 | -90 |
| ψ^1 Aquarii | 4.1 | 2.37 | 12.0 | 9 40.6 | 14 31.5 | + 6 42.1 | -1.1270 | 0.5488 | 0.2514 | -24 | -90 |
| ψ^2 Aquarii | 4.2 | 2.38 | 12.1 | 9 46.5 | 15 27.2 | + 7 35.8 | -0.7936 | 0.5488 | 0.2525 | - 2 | -90 |
| ψ^3 Aquarii | 4.8 | +2.38 | +12.0 | -10 12.2 | 15 55.7 | + 8 3.3 | -0.2416 | 0.5485 | +0.2530 | +27 | -56 |
| B. A. C. 8274 | 7.0 | 2.49 | 14.0 | 6 59.0 | 11 5 21.9 | - 2 57.9 | +0.0102 | 0.5494 | 0.2651 | +41 | -42 |
| 14 Ceti | 6.0 | 2.64 | 16.7 | 1 6.0 | 12 2 48.2 | - 6 15.2 | -0.0555 | 0.5530 | 0.2784 | +40 | -46 |
| 15 Ceti | 6.8 | 2.65 | 16.8 | - 1 6.0 | 3 57.8 | + 5 7.9 | +0.2672 | 0.5533 | 0.2785 | +58 | -29 |
| f Piscium | 5.1 | 2.78 | 17.9 | + 3 2.7 | 21 57.4 | -11 45.1 | +1.1080 | 0.5602 | 0.2785 | +90 | +20 |
| 96 Piscium | 6.6 | +2.82 | +18.5 | + 6 44.1 | 13 2 59.1 | - 6 53.7 | -1.2330 | 0.5618 | +0.2764 | -29 | -83 |
| μ Piscium | 5.0 | 2.83 | 18.4 | 5 35.1 | 3 28.9 | - 6 25.0 | +0.0691 | 0.5622 | 0.2761 | +47 | -38 |
| o Piscium | 4.4 | 2.89 | 18.7 | 8 36.9 | 10 15.1 | + 0 7.3 | -1.1420 | 0.5650 | 0.2725 | -22 | -81 |
| o Arietis | 6.0 | 3.11 | 17.9 | 14 51.3 | 14 11 57.4 | + 0 54.9 | -0.7937 | 0.5800 | 0.2458 | 0 | -75 |
| σ Arietis | 5.5 | 3.13 | 17.6 | 14 38.2 | 14 54.3 | + 3 45.3 | +0.1468 | 0.5820 | 0.2415 | +51 | -29 |
| 13 Tauri | 5.7 | +3.30 | +15.5 | +19 21.3 | 15 12 1.2 | + 0 5.1 | +0.0069 | 0.5951 | +0.2028 | +43 | -32 |
| A ¹ Tauri | 4.7 | 3.37 | 14.2 | 21 47.2 | 21 3.9 | + 8 47.0 | -0.7750 | 0.5991 | 0.1820 | - 1 | -68 |
| A ² Tauri | 6.3 | 3.37 | 14.1 | 21 43.1 | 21 19.3 | + 9 1.9 | -0.6574 | 0.5991 | 0.1814 | + 6 | -67 |
| κ^1 Tauri | 4.7 | 3.39 | 12.8 | 22 2.8 | 16 5 21.2 | - 7 14.9 | +0.3791 | 0.6034 | 0.1614 | +66 | - 9 |
| κ^2 Tauri | 6.3 | 3.39 | 12.8 | 21 57.2 | 5 22.5 | - 7 13.6 | +0.4800 | 0.6034 | 0.1614 | +74 | - 4 |
| ν^1 Tauri | 4.7 | +3.40 | +12.7 | +22 34.1 | 5 43.2 | - 6 53.8 | -0.1061 | 0.6034 | +0.1605 | +37 | -33 |
| ν^2 Tauri | 6.0 | 3.41 | 12.6 | 22 45.2 | 6 6.8 | - 6 31.1 | -0.2365 | 0.6036 | 0.1595 | +29 | -41 |
| τ Tauri | 4.5 | 3.41 | 11.4 | 22 45.1 | 12 3.4 | - 0 48.4 | +0.6666 | 0.6056 | 0.1436 | +90 | + 8 |
| 95 Tauri | 6.3 | 3.44 | 11.2 | 23 53.1 | 12 25.4 | - 0 27.4 | -0.4695 | 0.6060 | 0.1428 | +17 | -53 |
| 99 Tauri | 6.0 | 3.43 | 10.2 | 23 46.8 | 18 11.2 | + 5 4.9 | +0.4160 | 0.6060 | 0.1264 | +72 | - 4 |
| k Tauri | 6.0 | +3.46 | +10.0 | +24 53.1 | 18 18.1 | + 5 11.5 | -0.7285 | 0.6070 | +0.1263 | + 1 | -65 |
| 103 Tauri | 5.0 | 3.43 | 9.3 | 24 7.4 | 22 14.0 | + 8 58.1 | +0.5457 | 0.6075 | 0.1149 | +80 | + 4 |
| 118 Tauri | 6.7 | 3.44 | 7.6 | 25 3.8 | 17 6 31.4 | - 7 4.3 | +0.4102 | 0.6075 | 0.0907 | +69 | - 1 |
| 125 Tauri | 6.0 | 3.47 | 6.5 | 25 50.3 | 10 36.3 | - 3 9.1 | -0.0636 | 0.6082 | 0.0787 | +39 | -24 |
| 139 Tauri | 5.3 | 3.43 | + 5.0 | 25 56.5 | 17 45.9 | + 3 43.5 | +0.3139 | 0.6075 | +0.0571 | +62 | - 3 |
| 39 Geminorum | 6.3 | +3.25 | 0.0 | +26 13.5 | 18 17 53.4 | + 2 54.0 | +0.5152 | 0.5978 | -0.0151 | +78 | +11 |
| 40 Geminorum | 6.3 | 3.25 | - 0.1 | 26 3.9 | 18 9.3 | + 3 9.4 | +0.6821 | 0.5976 | 0.0158 | +90 | +20 |
| 47 Geminorum | 6.0 | 3.22 | 1.3 | 27 2.1 | 22 57.6 | + 7 46.6 | -0.4730 | 0.5939 | 0.0297 | +16 | -44 |
| ν Geminorum | 4.3 | 3.13 | 3.4 | 27 8.2 | 19 9 2.3 | - 6 31.7 | -1.0260 | 0.5861 | 0.0573 | -21 | -63 |
| c Geminorum | 6.0 | 3.05 | 3.3 | 26 2.6 | 12 28.5 | - 3 13.2 | -0.0524 | 0.5835 | 0.0653 | +39 | -23 |
| ω^1 Cancri | 6.0 | +2.96 | - 4.8 | +25 41.4 | 19 34.8 | + 3 37.5 | -0.2086 | 0.5780 | -0.0845 | +31 | -33 |
| ω^2 Cancri | 6.3 | +2.96 | - 4.8 | +25 23.4 | 19 55.8 | + 3 57.6 | +0.0889 | 0.5776 | -0.0855 | +48 | -17 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | | Limiting Parallels | |
|---------------------|------|------------------------|----------------|--------------------------|--------------------------|-----------------|---------|--------|---------|------|-----------------------|--|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination. | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. | |
| | | $\Delta\alpha$ | $\Delta\delta$ | | | | | | | | | |
| ψ^1 Cancri | 6.8 | +2.94 | - 5.5 | +26° 9.9 | 19 23 33.3 | + 7 27.3 | -1.0820 | 0.5745 | -0.0944 | -25° | -64° | |
| ψ^2 Cancri | 5.7 | 2.92 | 5.6 | 25 50.3 | 23 39.9 | + 7 33.6 | -0.7363 | 0.5742 | 0.0957 | + 1 | -63 | |
| λ Cancri | 5.7 | 2.84 | 5.9 | 24 21.9 | 20 4 3.5 | +11 47.7 | +0.4335 | 0.5703 | 0.1051 | +71 | - 1 | |
| ν^1 Cancri | 6.0 | 2.82 | 6.5 | 24 53.5 | 6 44.0 | - 7 37.4 | -0.4317 | 0.5675 | 0.1112 | +18 | -48 | |
| ν^2 Cancri | 5.8 | 2.80 | 6.5 | 24 30.3 | 7 35.8 | - 8 47.5 | -0.1039 | 0.5661 | 0.1130 | +37 | -30 | |
| ν^3 Cancri | 6.0 | +2.78 | - 6.7 | +24 26.9 | 8 52.8 | - 7 33.2 | -0.1898 | 0.5658 | -0.1159 | +32 | -35 | |
| ν^4 Cancri | 5.7 | 2.78 | 6.9 | 24 27.3 | 9 32.3 | - 6 55.1 | -0.2737 | 0.5652 | 0.1174 | +27 | -39 | |
| ξ Cancri | 5.0 | 2.53 | 8.8 | 22 29.1 | 21 2 4.3 | + 9 3.2 | -0.3333 | 0.5488 | 0.1504 | +24 | -46 | |
| 79 Cancri | 6.3 | 2.52 | 8.8 | 22 26.2 | 2 32.0 | + 9 29.9 | -0.3524 | 0.5489 | 0.1515 | +23 | -48 | |
| B. A. C. 3138 | 6.3 | 2.49 | 8.7 | 21 43.8 | 4 4.5 | +10 59.4 | +0.1909 | 0.5474 | 0.1542 | +54 | -19 | |
| B. A. C. 3206 | 6.3 | +2.40 | - 8.8 | +20 15.4 | 9 21.4 | - 7 54.0 | +0.9743 | 0.5409 | -0.1629 | +90 | +23 | |
| η Leonis | 3.3 | 2.08 | 10.0 | 17 17.5 | 22 6 15.9 | -11 38.9 | +0.5065 | 0.5219 | 0.1936 | +75 | - 8 | |
| 42 Leonis | 6.0 | 1.98 | 10.1 | 15 31.4 | 13 41.1 | - 4 27.1 | +0.9926 | 0.5172 | 0.2026 | +90 | +19 | |
| i Leonis | 5.7 | 1.91 | 10.3 | 14 41.6 | 19 3.7 | + 0 46.0 | +0.8063 | 0.5125 | 0.2083 | +90 | + 6 | |
| k Leonis | 5.7 | 1.82 | 10.8 | 14 46.0 | 23 2 33.5 | + 8 2.8 | -0.8636 | 0.5072 | 0.2156 | - 4 | -75 | |
| ω Virginis | 5.9 | +1.47 | -10.4 | + 8 44.1 | 24 6 57.6 | +11 39.4 | -0.6085 | 0.4903 | -0.2344 | +11 | -77 | |
| ν Virginis | 4.0 | 1.43 | 10.1 | 7 8.2 | 11 5.8 | - 8 19.2 | +0.1802 | 0.4892 | 0.2365 | +53 | -32 | |
| c Virginis | 5.5 | 1.23 | 9.9 | + 3 55.0 | 25 6 34.7 | +10 38.4 | -0.9397 | 0.4841 | 0.2422 | - 8 | -86 | |
| 46 Virginis | 6.1 | 1.02 | 8.7 | - 2 47.0 | 26 5 21.1 | + 8 48.3 | +0.8694 | 0.4816 | 0.2420 | +87 | + 3 | |
| 48 Virginis | 6.7 | 1.01 | 8.6 | 3 4.7 | 7 13.1 | +10 37.3 | +0.7369 | 0.4820 | 0.2417 | +84 | - 4 | |
| 65 Virginis | 6.1 | +0.93 | - 8.5 | - 4 21.4 | 18 6.1 | - 2 47.3 | -0.4900 | 0.4839 | -0.2394 | +17 | -72 | |
| 66 Virginis | 6.0 | 0.93 | 8.5 | 4 35.7 | 18 47.0 | - 2 7.5 | -0.3971 | 0.4832 | 0.2388 | +22 | -66 | |
| l^2 Virginis | 5.1 | 0.90 | 8.6 | 5 41.7 | 22 54.8 | + 1 53.6 | -0.1910 | 0.4839 | 0.2378 | +32 | -53 | |
| m Virginis | 5.4 | 0.86 | 7.1 | 8 9.2 | 27 4 13.5 | + 7 3.6 | +1.2090 | 0.4853 | 0.2352 | +82 | +28 | |
| B. A. C. 4647 mult. | 6.4 | 0.82 | 8.0 | 7 31.4 | 11 33.2 | - 9 48.6 | -1.1790 | 0.4875 | 0.2314 | -27 | -90 | |
| W. xiii, 825 | 6.8 | +0.82 | - 7.6 | - 9 1.6 | 11 58.8 | - 9 24.0 | +0.3386 | 0.4876 | -0.2312 | +59 | -25 | |
| 95 Virginis | 6.0 | 0.80 | 7.7 | 8 47.7 | 17 54.0 | - 3 38.7 | -1.2700 | 0.4902 | 0.2277 | -36 | -90 | |
| 96 Virginis | 6.9 | 0.79 | 7.5 | 9 49.2 | 19 6.8 | - 2 28.0 | -0.4436 | 0.4909 | 0.2272 | +17 | -69 | |
| κ Virginis | 4.2 | 0.78 | 7.6 | 9 46.1 | 21 11.7 | - 0 26.7 | -0.9698 | 0.4913 | 0.2255 | -13 | -90 | |
| 2 Libræ | 6.5 | 0.75 | 7.4 | 11 13.1 | 28 2 46.6 | + 4 58.7 | -0.6637 | 0.4932 | 0.2211 | + 5 | -88 | |
| μ Libræ | 5.7 | +0.71 | - 7.1 | -13 41.7 | 16 13.2 | - 5 58.2 | -0.9168 | 0.5010 | -0.2090 | -12 | -90 | |
| α^1 Libræ | 6.3 | 0.71 | 6.8 | 15 32.7 | 16 53.7 | - 5 19.0 | +0.9061 | 0.5013 | 0.2084 | +74 | + 7 | |
| α^2 Libræ | 2.9 | 0.71 | 6.8 | 15 35.4 | 16 59.5 | - 5 13.3 | +0.9345 | 0.5013 | 0.2084 | +74 | + 9 | |
| ν^1 Libræ | 5.5 | +0.69 | - 6.8 | -15 50.1 | 20 0 57.1 | + 2 29.9 | -0.4320 | 0.5063 | -0.1996 | +13 | -69 | |
| NEW MOON. | | | | | | | | | | | | |

NEW MOON.

DECEMBER.

| | | | | | | | | | | | |
|-----------------------|-----|-------|-------|----------|-----------|----------|---------|--------|---------|-----|-----|
| MERCURY | | | | -25 50.5 | 2 8 31.7 | + 7 21.0 | -0.5247 | 0.5154 | -0.0472 | - 9 | -79 |
| B. A. C. 6194 | 5.1 | +0.94 | - 5.1 | -27 5.0 | 14 19.1 | -11 4.7 | +0.5778 | 0.5937 | -0.0324 | +52 | -10 |
| λ Sagittarii | 2.9 | 0.96 | 4.7 | 25 28.9 | 18 24.5 | - 7 8.7 | -1.2700 | 0.5944 | 0.0208 | -64 | -90 |
| ϕ Sagittarii | 3.7 | 1.03 | 4.5 | 27 6.2 | 3 1 33.8 | - 0 15.8 | +0.4133 | 0.5966 | -0.0004 | +38 | -18 |
| σ Sagittarii | 2.3 | 1.06 | 4.1 | 26 26.0 | 5 28.5 | + 3 29.8 | -0.2900 | 0.5969 | +0.0112 | 0 | -61 |
| ψ Sagittarii | 6.4 | 1.12 | 3.4 | 25 26.6 | 13 41.7 | +11 24.0 | -1.1690 | 0.5980 | 0.0349 | -51 | -90 |
| B. A. C. 6666 | 5.8 | +1.19 | - 3.4 | -27 12.4 | 19 27.2 | - 7 3.8 | +0.9838 | 0.5978 | +0.0518 | +63 | +17 |
| h^2 Sagittarii | 4.6 | 1.20 | 2.7 | 25 7.4 | 22 15.8 | - 4 21.8 | -1.1040 | 0.5970 | 0.0596 | -44 | -90 |
| ω Sagittarii | 5.1 | 1.30 | 2.5 | 26 35.3 | 4 5 59.6 | + 3 4.3 | +0.0140 | 0.5953 | 0.0814 | +63 | +20 |
| A Sagittarii | 5.3 | 1.31 | - 2.4 | 26 29.4 | 7 16.4 | + 4 18.2 | +0.0180 | 0.5946 | 0.0549 | +64 | +20 |
| χ Capricorni | 5.4 | 1.57 | + 1.3 | 21 37.9 | 5 12 10.3 | + 8 6.8 | -0.6042 | 0.5826 | 0.1590 | - 3 | -85 |
| 27 Capricorni | 6.5 | +1.56 | + 1.4 | -20 59.6 | 12 35.7 | + 8 31.3 | -1.2130 | 0.5826 | +0.1601 | -44 | -90 |
| ϕ Capricorni | 5.5 | 1.59 | 1.8 | 21 6.3 | 15 10.4 | +11 0.3 | -0.6736 | 0.5804 | 0.1658 | - 6 | -90 |
| 33 Capricorni | 5.7 | 1.64 | 2.0 | 21 18.9 | 18 48.4 | - 9 29.7 | +0.1655 | 0.5781 | 0.1738 | +38 | -33 |
| 35 Capricorni | 6.2 | 1.66 | 2.0 | 21 40.0 | 20 7.4 | - 8 13.6 | +0.7676 | 0.5776 | 0.1766 | +68 | 0 |
| 37 Capricorni | 6.0 | 1.68 | 2.6 | 20 34.2 | 23 24.2 | - 5 3.9 | +0.2004 | 0.5754 | 0.1834 | +41 | -32 |
| ϵ Capricorni | 4.7 | +1.70 | + 3.1 | -19 57.2 | 6 0 22.2 | - 4 8.0 | -0.2707 | 0.5754 | +0.1855 | +17 | -59 |
| κ Capricorni | 5.0 | +1.72 | + 3.4 | -19 21.6 | 2 46.9 | - 1 48.5 | -0.4422 | 0.5731 | +0.1902 | + 9 | -70 |

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

| THE STAR'S | | | | | AT CONJUNCTION IN R. A. | | | | | | Limiting Parallels. | |
|---------------------------------|------|------------------------|----------------|-------------------------|--------------------------|-----------------|---------|--------|---------|-----|------------------------|--|
| Name. | Mag. | Red'ns from 1891.0. | | Apparent Declination | Washington Mean Time. | Hour Angle H | Y | z' | y' | N. | S. | |
| | | $\Delta\alpha$ | $\Delta\delta$ | | | | | | | | | |
| B. A. C. 7550 | 6.3 | +1.73 | + 3.1 | -20 7.0 | d h m 6 3 1.4 | h m - 1 34.4 | +0.4018 | 0.5731 | +0.1905 | +53 | -21 | |
| 29 Aquarii <i>mult.</i> | 6.5 | 1.80 | 4.8 | 17 29.2 | 11 26.4 | + 6 32.5 | -0.6904 | 0.5678 | 0.2065 | - 3 | -90 | |
| 56 Aquarii | 6.3 | 1.90 | 6.6 | 15 8.4 | 23 50.8 | - 5 28.9 | -0.4521 | 0.5609 | 0.2266 | +13 | -70 | |
| γ^1 Aquarii <i>mult.</i> | 5.8 | 1.98 | 7.5 | 14 37.7 | 7 7 43.5 | + 2 7.6 | +0.8424 | 0.5565 | 0.2375 | +75 | + 3 | |
| γ^2 Aquarii | 4.1 | 1.98 | 7.7 | 14 10.0 | 8 35.3 | + 2 57.6 | +0.5685 | 0.5563 | 0.2387 | +70 | -13 | |
| 74 Aquarii | 6.0 | +1.98 | + 8.5 | -12 11.7 | 10 22.2 | + 4 40.7 | -1.0560 | 0.5552 | +0.2410 | -20 | -90 | |
| ψ^1 Aquarii | 4.1 | 2.07 | 10.1 | 9 40.6 | 20 39.6 | - 9 22.5 | -1.1220 | 0.5504 | 0.2522 | -23 | -90 | |
| ψ^2 Aquarii | 4.2 | 2.08 | 10.2 | 9 46.5 | 21 36.7 | - 8 27.3 | -0.7793 | 0.5503 | 0.2533 | - 1 | -90 | |
| ψ^3 Aquarii | 4.8 | 2.09 | 10.0 | 10 12.2 | 22 5.8 | - 7 59.2 | -0.2134 | 0.5493 | 0.2533 | +29 | -55 | |
| B. A. C. 8274 | 7.0 | 2.23 | 12.1 | 6 59.0 | 8 11 54.0 | + 5 21.7 | +0.0462 | 0.5448 | 0.2641 | +44 | -40 | |
| 14 Ceti | 6.0 | +2.43 | +14.9 | - 1 6.1 | 9 10 0.8 | + 2 45.0 | -0.0220 | 0.5396 | +0.2714 | +41 | -44 | |
| 15 Ceti | 6.8 | 2.44 | 15.0 | - 1 6.1 | 11 13.0 | + 3 54.9 | +0.3068 | 0.5396 | 0.2717 | +60 | -26 | |
| f Piscium | 5.1 | 2.65 | 16.5 | + 3 2.6 | 10 5 49.7 | - 2 5.0 | +1.1380 | 0.5394 | 0.2679 | +90 | +22 | |
| 96 Piscium | 6.6 | 2.71 | 17.5 | 6 44.0 | 11 1.8 | + 2 56.7 | -1.1930 | 0.5405 | 0.2657 | -26 | -83 | |
| μ Piscium | 5.0 | 2.71 | 17.2 | 5 35.1 | 11 32.7 | + 3 26.6 | +0.0990 | 0.5407 | 0.2654 | +48 | -36 | |
| σ Piscium | 4.4 | +2.81 | +18.0 | + 8 36.9 | 18 32.8 | +10 12.8 | -1.1040 | 0.5413 | +0.2605 | -19 | -81 | |
| α Arietis | 6.0 | 3.16 | 18.1 | 14 51.3 | 11 21 4.4 | +11 49.8 | -0.7546 | 0.5485 | 0.2322 | + 2 | -73 | |
| σ Arietis | 5.5 | 3.20 | 17.8 | 14 38.2 | 12 0 6.2 | - 9 14.9 | +0.1609 | 0.5503 | 0.2278 | +52 | -29 | |
| 53 Arietis | 6.3 | 3.31 | 17.7 | 17 27.8 | 6 58.2 | - 2 37.5 | -1.1205 | 0.5531 | 0.2171 | -23 | -73 | |
| 13 Tauri | 5.7 | 3.50 | 16.0 | 19 21.3 | 21 43.5 | +11 35.5 | +0.0115 | 0.5589 | 0.1899 | +43 | -32 | |
| 14 Tauri | 6.3 | +3.50 | +15.9 | +19 19.5 | 22 20.0 | -11 49.4 | +0.1553 | 0.5594 | +0.1888 | +52 | -24 | |
| B. A. C. 1143 | 6.0 | 3.53 | 16.1 | 20 35.3 | 22 36.1 | -11 33.9 | -1.0460 | 0.5593 | 0.1882 | -19 | -69 | |
| A ¹ Tauri | 4.7 | 3.64 | 14.9 | 21 47.2 | 13 6 56.4 | - 3 32.4 | -0.7403 | 0.5626 | 0.1704 | + 2 | -68 | |
| A ² Tauri | 6.3 | 3.64 | 14.8 | 21 43.1 | 7 11.9 | - 3 17.5 | -0.6296 | 0.5628 | 0.1698 | + 8 | -65 | |
| 51 Tauri | 6.0 | 3.67 | 13.8 | 21 19.0 | 12 32.2 | + 1 50.7 | +0.6428 | 0.5649 | 0.1575 | +89 | + 5 | |
| 53 Tauri | 6.0 | +3.67 | +13.7 | +20 52.9 | 12 58.4 | + 2 15.9 | +1.1460 | 0.5650 | +0.1565 | +90 | +37 | |
| 56 Tauri | 6.0 | 3.68 | 13.8 | 21 30.8 | 13 2.0 | + 2 19.3 | +0.5271 | 0.5650 | 0.1563 | +78 | - 2 | |
| κ^1 Tauri | 4.7 | 3.71 | 13.4 | 22 2.8 | 15 21.2 | + 4 33.2 | +0.3553 | 0.5657 | 0.1509 | +64 | -10 | |
| κ^2 Tauri | 6.3 | 3.71 | 13.4 | 21 57.2 | 15 22.5 | + 4 34.5 | +0.4511 | 0.5657 | 0.1509 | +72 | - 6 | |
| ν^1 Tauri | 4.7 | 3.73 | 13.4 | 22 34.1 | 15 43.4 | + 4 54.6 | -1.1074 | 0.5658 | 0.1499 | +37 | -33 | |
| ν^2 Tauri | 6.0 | +3.73 | +13.3 | +22 45.2 | 16 7.3 | + 5 17.7 | -0.2314 | 0.5663 | +0.1489 | +30 | -40 | |
| τ Tauri | 4.5 | 3.79 | 12.1 | 22 45.1 | 22 8.1 | +11 4.4 | +0.6230 | 0.5676 | 0.1341 | +88 | + 6 | |
| 118 Tauri | 5.7 | 3.95 | 8.2 | 25 3.8 | 14 16 43.5 | + 4 55.9 | +0.3681 | 0.5710 | 0.0844 | +66 | - 3 | |
| 139 Tauri | 5.3 | 4.02 | + 5.4 | 25 56.5 | 15 3 58.6 | - 8 15.7 | +0.2678 | 0.5712 | 0.0528 | +59 | - 5 | |
| 47 Geminorum | 6.0 | 4.01 | - 1.9 | 27 2.1 | 16 8 58.6 | - 4 24.3 | -0.4813 | 0.5627 | +0.0288 | +15 | -45 | |
| A Geminorum | 5.7 | +3.93 | - 2.9 | +25 15.5 | 13 54.0 | + 0 19.7 | +1.1350 | 0.5595 | -0.0418 | +90 | +48 | |
| ν Geminorum | 4.3 | 3.96 | 4.4 | 27 8.1 | 18 56.0 | + 5 10.1 | -1.0120 | 0.5575 | 0.0551 | -20 | -63 | |
| ϵ Geminorum | 6.0 | 3.89 | 5.3 | 26 2.5 | 22 19.5 | + 8 25.9 | -0.1051 | 0.5552 | 0.0641 | +36 | -25 | |
| ω^1 Cancri | 6.0 | 3.84 | 6.7 | 25 41.3 | 17 5 19.5 | - 8 49.8 | -0.2542 | 0.5521 | 0.0815 | +28 | -35 | |
| ω^2 Cancri | 6.3 | 3.83 | 6.7 | 25 23.3 | 5 40.0 | - 8 30.0 | +0.0238 | 0.5507 | 0.0821 | +44 | -21 | |
| ψ^1 Cancri | 6.8 | +3.82 | - 7.7 | +26 9.8 | 9 14.0 | - 5 4.0 | -1.0750 | 0.5469 | -0.0904 | -24 | -64 | |
| ψ^2 Cancri | 5.7 | 3.81 | 7.6 | 25 50.2 | 9 20.6 | - 4 57.7 | -0.7525 | 0.5468 | 0.0910 | - 1 | -64 | |
| λ Cancri | 5.7 | 3.73 | 8.3 | 24 21.8 | 13 40.1 | - 0 47.6 | +0.3419 | 0.5445 | 0.1009 | +64 | - 7 | |
| ν^1 Cancri <i>mult.</i> | 6.0 | 3.72 | 8.9 | 24 53.4 | 16 17.8 | + 1 44.4 | -0.4735 | 0.5434 | 0.1069 | +16 | -51 | |
| ν^2 Cancri | 5.8 | 3.70 | 9.1 | 24 30.2 | 17 8.8 | + 2 33.5 | -0.1663 | 0.5428 | 0.1088 | +33 | -33 | |
| ν^3 Cancri | 6.0 | +3.69 | - 9.3 | +24 26.8 | 18 24.4 | + 3 46.4 | -0.2470 | 0.5413 | -0.1115 | +29 | -38 | |
| ν^4 Cancri | 5.7 | 3.69 | 9.5 | 24 27.2 | 19 3.2 | + 4 23.9 | -0.3276 | 0.5407 | 0.1127 | +24 | -43 | |
| ξ Cancri | 5.0 | 3.46 | 12.2 | 22 29.1 | 18 11 18.1 | - 3 55.1 | -0.3986 | 0.5285 | 0.1453 | +21 | -51 | |
| 79 Cancri | 6.3 | 3.46 | 12.2 | 22 26.2 | 11 45.3 | - 3 28.8 | -0.4142 | 0.5283 | 0.1463 | +20 | -52 | |
| B. A. C. 3138 | 6.3 | 3.42 | 12.3 | 21 43.8 | 13 16.1 | - 2 1.0 | +0.0972 | 0.5271 | 0.1491 | +48 | -24 | |
| B. A. C. 3206 | 6.3 | +3.33 | -12.8 | +20 15.4 | 18 27.6 | + 3 0.1 | +0.8397 | 0.5231 | -0.1581 | +90 | +15 | |
| η Leonis | 3.3 | 3.03 | 14.9 | 17 17.4 | 19 15 1.2 | - 1 5.7 | +0.3863 | 0.5083 | 0.1889 | +66 | -15 | |
| 42 Leonis | 6.0 | 2.92 | 15.3 | 15 31.2 | 22 19.9 | + 5 59.6 | +0.8511 | 0.5046 | 0.1979 | +90 | +10 | |
| δ Leonis | 5.7 | 2.85 | 15.6 | 14 41.5 | 20 3 38.0 | +11 8.2 | +0.6725 | 0.5012 | 0.2042 | +90 | - 2 | |
| κ Leonis | 5.7 | 2.70 | 16.4 | 14 45.9 | 11 1.8 | - 5 41.0 | -0.9464 | 0.4968 | 0.2115 | -10 | -75 | |
| ω Virginis | 5.9 | +2.39 | -16.5 | + 8 44.0 | 21 15 10.3 | - 2 20.1 | -0.7173 | 0.4861 | -0.2326 | + 5 | -78 | |
| ν Virginis | 4.0 | +2.33 | -16.2 | + 7 8.1 | 19 17.2 | + 1 39.9 | +0.0581 | 0.4854 | -0.2347 | +46 | -38 | |

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1891.

| Date. | THE STAR'S | | IMMERSION. | | | | EMERSION. | | | | Duration of Occul- tation. |
|---------|------------------------------|------|------------------------------------|------------------------------------|-----------------|---------|--------------------------------------|--------------------------------------|-----------------|---------|-----------------------------------|
| | | | Washington. | | Angle from | | Washington. | | Angle from | | |
| | Name. | Mag. | Sidereal Time. | Mean Time. | North Point. | Vertex. | Sidereal Time. | Mean Time. | North Point. | Vertex. | |
| Jan. 7 | 39 Ophiuchi† mult. | 5.5 | ^h ^m 12 21 | ^h ^m 17 10 | 167° | 214° | ^h ^m 12 50.8 | ^h ^m 17 39.9 | 227° | 272° | ^h ^m 0 30 |
| | NEW MOON. | | | | | | | | | | |
| 17 | B. A. C. 755 | 6.5 | 1 0 | 5 11 | 83 | 112 | 2 11.5 | 6 23.2 | 207 | 211 | 1 12 |
| 19 | ω ¹ Tauri | 6.0 | 0 41 | 4 45 | 27 | 81 | 1 42.1 | 5 45.9 | 278 | 328 | 1 1 |
| 21 | 5 Geminorum | 6.7 | 9 42 | 13 37 | 148 | 89 | 10 24.7 | 14 19.5 | 220 | 161 | 0 43 |
| 26 | i Leonis | 5.7 | 12 11 | 15 46 | 99 | 60 | 13 22.0 | 16 56.7 | 326 | 276 | 1 11 |
| 30 | 65 Virginis | 6.1 | 8 45 | 12 4 | 197 | 245 | 8 59.6 | 12 18.8 | 222 | 269 | 0 15 |
| 30 | l ² Virginis | 5.1 | 15 2 | 18 21 | 139 | 114 | 16 21.2 | 19 39.7 | 289 | 250 | 1 19 |
| 31 | κ Virginis | 4.2 | 10 55 | 14 10 | 104 | 143 | 12 6.6 | 15 21.5 | 327 | 355 | 1 12 |
| | NEW MOON. | | | | | | | | | | |
| Feb. 12 | f Piscium | 5.1 | 3 18 | 5 47 | 28 | 353 | 4 20.5 | 6 49.8 | 265 | 222 | 1 3 |
| 15 | ω ¹ Tauri† | 6.0 | 10 44 | 13 1 | 127 | 77 | 11 21.6 | 13 38.0 | 215 | 168 | 0 37 |
| 17 | 132 Tauri | 5.3 | 5 55 | 8 4 | 62 | 53 | 7 18.7 | 9 27.8 | 283 | 233 | 1 24 |
| 18 | ε Geminorum | 3.2 | 5 52 | 7 57 | 92 | 124 | 7 25.3 | 9 30.4 | 265 | 232 | 1 33 |
| 19 | κ Geminorum | 3.6 | 10 26 | 12 27 | 65 | 7 | 11 21.9 | 13 22.5 | 328 | 269 | 0 55 |
| 21 | B. A. C. 3206 | 6.3 | 8 55 | 10 47 | 86 | 100 | 10 13.4 | 12 6.2 | 325 | 296 | 1 19 |
| 22 | η Leonis | 3.3 | 5 32 | 7 21 | 19 | 74 | 5 36.6 | 7 25.9 | 10 | 65 | 0 5 |
| 24 | ν Virginis | 4.0 | 11 18 | 12 59 | 85 | 93 | 12 22.4 | 14 3.0 | 350 | 335 | 1 4 |
| Mar. 1 | 41 Libræ | 5.9 | 16 15 | 17 36 | 180 | 170 | 16 54.5 | 18 14.8 | 234 | 215 | 0 39 |
| | NEW MOON. | | | | | | | | | | |
| 16 | 121 Tauri | 6.0 | 9 53 | 10 15 | 156 | 98 | 10 20.0 | 10 42.5 | 205 | 148 | 0 27 |
| 18 | A Geminorum | 5.7 | 8 2 | 8 17 | 95 | 63 | 9 29.3 | 9 44.1 | 288 | 232 | 1 27 |
| 29 | ω ¹ Scorpii† | 4.6 | 10 43 | 10 14 | 62 | 110 | 11 19.2 | 10 50.0 | 350 | 36 | 0 36 |
| 29 | ω ² Scorpii† | 4.6 | 10 56 | 10 27 | 96 | 144 | 11 56.2 | 11 27.0 | 316 | 0 | 1 0 |
| | NEW MOON. | | | | | | | | | | |
| Apr. 11 | ω ² Tauri† | 6.3 | 11 7 | 9 47 | 126 | 77 | 11 43.5 | 10 23.6 | 217 | 170 | 0 37 |
| 18 | i Leonis | 5.7 | 12 55 | 11 8 | 134 | 87 | 14 10.5 | 12 22.7 | 302 | 249 | 1 15 |
| 22 | 65 Virginis | 6.1 | 8 15 | 6 12 | 104 | 154 | 9 18.6 | 7 15.4 | 319 | 5 | 1 4 |
| 22 | 66 Virginis | 6.0 | 9 4 | 7 0 | 115 | 162 | 10 14.8 | 8 11.5 | 313 | 353 | 1 11 |
| 25 | λ Libræ† | 5.1 | 12 24 | 10 8 | 107 | 145 | 13 35.7 | 11 20.1 | 313 | 341 | 1 12 |
| May 2 | τ ¹ Aquarii mult. | 5.8 | 17 26 | 14 42 | 20 | 69 | 18 5.3 | 15 21.4 | 301 | 348 | 0 39 |
| | NEW MOON. | | | | | | | | | | |
| 12 | κ Geminor. mult. | 3.6 | 14 2 | 10 39 | 130 | 77 | 14 48.0 | 11 25.7 | 256 | 208 | 0 46 |
| 14 | B. A. C. 3206 | 6.3 | 12 4 | 8 35 | 142 | 88 | 13 12.5 | 9 42.6 | 273 | 217 | 1 8 |
| 15 | η Leonis | 3.3 | 7 31 | 3 58 | 143 | 192 | 8 48.3 | 5 14.9 | 265 | 298 | 1 17 |
| 15 | 42 Leonis * | 6.0 | 17 17 | 13 42 | 114 | 65 | 18 8.5 | 14 33.9 | 291 | 247 | 0 52 |
| 17 | ν Virginis | 4.0 | 14 16 | 10 34 | 57 | 15 | 14 52.2 | 11 10.1 | 4 | 319 | 0 36 |
| 22 | 41 Libræ | 5.9 | 16 2 | 12 0 | 92 | 85 | 17 20.2 | 13 18.1 | 319 | 296 | 1 18 |
| 22 | κ Libræ | 5.1 | 18 11 | 14 9 | 104 | 72 | 19 23.3 | 15 25.9 | 291 | 248 | 1 17 |
| June 1 | 33 Ceti | 6.1 | 19 19 | 14 37 | 353 | 44 | 19 33.5 | 14 51.3 | 318 | 9 | 0 15 |
| 1 | 35 Ceti | 6.3 | 19 47 | 15 5 | 52 | 103 | 20 45.4 | 16 3.1 | 252 | 302 | 0 58 |
| | NEW MOON. | | | | | | | | | | |
| 18 | 28 Libræ | 6.0 | 19 25 | 13 37 | 153 | 109 | 20 5.8 | 14 17.2 | 242 | 195 | 0 40 |
| 27 | 30 Piscium† | 4.6 | 17 46 | 11 22 | 60 | 110 | 18 43.6 | 12 19.4 | 252 | 302 | 0 57 |

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.

* Whole occultation below the horizon of Washington.

† Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1891.

| Date. | THE STAR'S | | IMMERISION. | | | | EMERSION. | | | | Duration of Occultation. |
|----------|--------------------------------|------|---------------------------------|---------------------------------|--------------|---------|-----------------------------------|----------------------------------|--------------|---------|-------------------------------|
| | | | Washington. | | Angle from | | Washington. | | Angle from | | |
| | Name. | Mag. | Sidereal Time. | Mean Time. | North Point. | Vertex. | Sidereal Time. | Mean Time. | North Point. | Vertex. | |
| June 27 | 33 Piscium | 4.7 | ^h 19 ^m 23 | ^h 12 ^m 58 | 76° | 124° | ^h 20 ^m 26.8 | ^h 14 ^m 2.3 | 226° | 262° | ^h 1 ^m 4 |
| | NEW MOON. | | | | | | | | | | |
| July 16 | κ Libræ | 5.1 | 14 20 | 6 42 | 120 | 137 | 15 39.6 | 8 1.4 | 296 | 294 | 1 19 |
| 19 | φ Sagittarii | 3.7 | 19 37 | 11 46 | 126 | 114 | 20 37.7 | 12 46.9 | 226 | 202 | 1 1 |
| 23 | τ ¹ Aquarii † mult. | 5.8 | 17 18 | 9 12 | 57 | 107 | 18 18.1 | 10 11.7 | 263 | 309 | 1 0 |
| 29 | ω ³ Tauri | 5.7 | 23 17 | 14 46 | 123 | 179 | 23 51.6 | 15 20.7 | 187 | 243 | 0 35 |
| | NEW MOON. | | | | | | | | | | |
| Aug. 18 | 35 Capricorni | 6.2 | 21 25 | 11 36 | 121 | 120 | 22 6.6 | 12 17.6 | 186 | 176 | 0 42 |
| 18 | 37 Capricorni † | 6.0 | 1 31 | 15 42 | 78 | 34 | 2 27.3 | 16 37.8 | 230 | 182 | 0 56 |
| 22 | f Piscium | 5.1 | 23 29 | 13 24 | 100 | 130 | 0 19.6 | 14 14.4 | 185 | 202 | 0 51 |
| 25 | B. A. C. 1242 | 6.3 | 0 6 | 13 49 | 36 | 92 | 1 8.4 | 14 51.2 | 269 | 323 | 1 2 |
| | NEW MOON. | | | | | | | | | | |
| Sept. 10 | 18 Ophiuchi | 6.7 | 18 10 | 6 51 | 125 | 107 | 19 27.4 | 8 8.5 | 258 | 226 | 1 17 |
| 12 | φ Sagittarii | 3.7 | 17 50 | 6 24 | 47 | 57 | 18 52.1 | 7 25.3 | 315 | 312 | 1 2 |
| 16 | τ ¹ Aquarii † mult. | 5.8 | 17 25 | 5 42 | 67 | 116 | 18 26.5 | 6 43.8 | 251 | 296 | 1 1 |
| 16 | τ ² Aquarii | 4.1 | 18 54 | 7 11 | 355 | 38 | 19 15.7 | 7 32.9 | 317 | 358 | 0 22 |
| 22 | τ Tauri | 4.5 | 3 15 | 15 7 | 95 | 137 | 4 28.4 | 16 20.7 | 221 | 226 | 1 14 |
| 28 | η Leonis † | 3.3 | 2 58 | 14 26 | 89 | 138 | 3 55.6 | 15 24.2 | 296 | 348 | 0 58 |
| | NEW MOON. | | | | | | | | | | |
| Oct. 5 | α ² Libræ | 2.9 | 17 7 | 4 10 | 119 | 88 | 18 27.0 | 5 30.1 | 291 | 249 | 1 20 |
| 10 | B. A. C. 6666 | 5.8 | 22 7 | 8 50 | 165 | 133 | Star 0'.1 south of | | D's limb. | | |
| 12 | 35 Capricorni | 6.2 | 20 36 | 7 11 | 54 | 64 | 21 54.8 | 8 29.6 | 255 | 248 | 1 19 |
| 12 | 37 Capricorni | 6.0 | 1 27 | 12 2 | 18 | 334 | 2 10.7 | 12 45.0 | 288 | 242 | 0 43 |
| 19 | 56 Tauri | 6.0 | 6 52 | 16 58 | 159 | 105 | 6 59.8 | 17 5.6 | 172 | 117 | 0 7 |
| 20 | 103 Tauri | 6.0 | 0 2 | 10 5 | 50 | 107 | 1 0.3 | 11 2.9 | 270 | 329 | 0 58 |
| | NEW MOON. | | | | | | | | | | |
| Nov. 14 | σ Arietis | 5.5 | 7 25 | 15 49 | 51 | 357 | 8 20.0 | 16 43.5 | 269 | 216 | 0 55 |
| 15 | 13 Tauri | 5.7 | 4 3 | 12 23 | 333 | 318 | Star 0'.6 north of | | D's limb. | | |
| 17 | 139 Tauri | 5.3 | 10 21 | 18 32 | 95 | 36 | 11 16.6 | 19 27.8 | 312 | 256 | 0 56 |
| | NEW MOON. | | | | | | | | | | |
| Dec. 7 | τ ¹ Aquarii mult. | 5.8 | 1 28 | 8 22 | 147 | 113 | Star 0'.9 south of | | D's limb. | | |
| 7 | τ ² Aquarii | 4.1 | 2 21 | 9 15 | 92 | 50 | 3 11.7 | 10 5.6 | 205 | 159 | 0 51 |
| 9 | 14 Ceti | 6.0 | 4 43 | 11 28 | 341 | 293 | 4 56.6 | 11 42.4 | 314 | 265 | 0 14 |
| 9 | 15 Ceti | 6.8 | 5 22 | 12 7 | 74 | 24 | 6 17.4 | 13 3.0 | 229 | 178 | 0 56 |
| 10 | μ Piscium | 5.0 | 5 53 | 12 35 | 37 | 347 | 6 47.9 | 13 29.5 | 269 | 217 | 0 55 |
| 13 | 56 Tauri | 6.0 | 7 28 | 13 58 | 167 | 111 | Star 0'.9 south of | | D's limb. | | |
| 13 | λ ¹ Tauri | 4.7 | 9 46 | 16 15 | 80 | 25 | 10 43.3 | 17 12.4 | 266 | 214 | 0 57 |
| 13 | κ ² Tauri | 6.3 | 9 47 | 16 16 | 100 | 45 | 10 42.1 | 17 11.2 | 245 | 193 | 0 55 |
| 14 | 118 Tauri | 5.7 | 11 15 | 17 40 | 67 | 12 | 12 6.0 | 18 31.0 | 293 | 242 | 0 51 |
| 17 | λ Cancri | 5.7 | 6 22 | 12 36 | 128 | 180 | 7 44.3 | 13 57.9 | 256 | 278 | 1 22 |
| 18 | B. A. C. 3138 | 6.3 | 5 20 | 11 30 | 77 | 134 | 6 34.7 | 12 44.4 | 311 | 5 | 1 14 |
| 19 | η Leonis | 3.3 | 7 42 | 13 48 | 141 | 189 | 9 4.7 | 15 10.2 | 272 | 299 | 1 22 |
| | NEW MOON. | | | | | | | | | | |

NOTE. The angles of position are counted from the north point and vertex of the moon's limb, toward the east.

* Whole occultation below the horizon of Washington.

† Immersion below the horizon of Washington.

‡ Emergence below the horizon of Washington.

| DOWNE'S TABLE GIVING VALUES OF τ . | | | | | | | | | | | | | | | | | | | | | | | |
|--|----|----------|-----|-----|----------|-----|-----|----------|-----|-----|----------|-----|-----|----------|-----|-----|----------|-----|-----|----------|-----|-----|--|
| FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION. | | | | | | | | | | | | | | | | | | | | | | | |
| A | | Lat. 72° | | | Lat. 66° | | | Lat. 60° | | | Lat. 54° | | | Lat. 48° | | | Lat. 42° | | | Lat. 36° | | | |
| | | z' | | | z' | | | z' | | | z' | | | z' | | | z' | | | z' | | | |
| | | .62 | .56 | .50 | .62 | .56 | .50 | .62 | .56 | .50 | .62 | .56 | .50 | .62 | .56 | .50 | .62 | .56 | .50 | .62 | .56 | .50 | |
| h | m | m | m | m | m | m | m | m | m | m | m | m | m | m | m | m | m | m | m | m | m | m | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 10 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 6 | 5 | 6 | 7 | 7 | |
| 20 | 3 | 3 | 4 | 4 | 5 | 5 | 5 | 6 | 7 | 6 | 7 | 9 | 8 | 9 | 11 | 9 | 10 | 12 | 11 | 12 | 14 | 14 | |
| 30 | 5 | 5 | 6 | 6 | 7 | 8 | 8 | 9 | 11 | 10 | 11 | 13 | 12 | 13 | 16 | 14 | 16 | 18 | 16 | 18 | 22 | 22 | |
| 40 | 6 | 7 | 8 | 8 | 9 | 11 | 11 | 12 | 14 | 13 | 15 | 17 | 16 | 18 | 21 | 18 | 21 | 24 | 21 | 24 | 29 | 29 | |
| 50 | 7 | 8 | 10 | 10 | 11 | 13 | 13 | 15 | 17 | 16 | 19 | 21 | 19 | 22 | 26 | 22 | 26 | 30 | 26 | 30 | 36 | 36 | |
| 1 | 0 | 9 | 10 | 11 | 12 | 14 | 16 | 16 | 18 | 21 | 22 | 26 | 23 | 26 | 31 | 26 | 31 | 36 | 30 | 35 | 42 | 42 | |
| 10 | 10 | 12 | 13 | 14 | 16 | 18 | 18 | 21 | 24 | 22 | 26 | 30 | 26 | 30 | 36 | 31 | 35 | 42 | 35 | 40 | 48 | 48 | |
| 20 | 12 | 13 | 15 | 16 | 18 | 21 | 21 | 23 | 27 | 25 | 29 | 34 | 30 | 34 | 40 | 35 | 40 | 47 | 39 | 45 | 54 | 54 | |
| 30 | 13 | 15 | 17 | 18 | 20 | 23 | 23 | 26 | 30 | 28 | 32 | 37 | 33 | 38 | 45 | 39 | 44 | 52 | 43 | 50 | 59 | 59 | |
| 40 | 14 | 16 | 18 | 20 | 22 | 25 | 25 | 29 | 33 | 31 | 35 | 41 | 36 | 42 | 49 | 42 | 48 | 57 | 47 | 54 | 64 | 64 | |
| 50 | 16 | 18 | 20 | 21 | 24 | 28 | 27 | 31 | 36 | 34 | 38 | 44 | 39 | 45 | 53 | 45 | 52 | 61 | 51 | 58 | 68 | 68 | |
| 2 | 0 | 17 | 19 | 22 | 23 | 26 | 30 | 29 | 33 | 39 | 36 | 41 | 47 | 42 | 48 | 56 | 48 | 55 | 65 | 54 | 62 | 72 | |
| 10 | 18 | 20 | 23 | 25 | 28 | 32 | 31 | 36 | 41 | 38 | 43 | 50 | 45 | 51 | 59 | 51 | 59 | 68 | 57 | 66 | 76 | 76 | |
| 20 | 19 | 22 | 24 | 26 | 30 | 34 | 33 | 38 | 43 | 40 | 46 | 53 | 47 | 54 | 62 | 54 | 62 | 71 | 60 | 69 | 80 | 80 | |
| 30 | 20 | 23 | 26 | 28 | 31 | 36 | 35 | 40 | 45 | 42 | 48 | 55 | 50 | 56 | 65 | 57 | 64 | 74 | 63 | 72 | 83 | 83 | |
| 40 | 21 | 24 | 27 | 29 | 33 | 37 | 37 | 42 | 47 | 44 | 50 | 58 | 52 | 59 | 68 | 59 | 67 | 77 | 65 | 74 | 86 | 86 | |
| 50 | 22 | 25 | 28 | 30 | 34 | 39 | 38 | 43 | 49 | 46 | 52 | 60 | 54 | 61 | 70 | 61 | 69 | 79 | 68 | 76 | 88 | 88 | |
| 3 | 0 | 23 | 26 | 30 | 31 | 35 | 40 | 40 | 45 | 51 | 48 | 54 | 62 | 56 | 63 | 72 | 63 | 71 | 81 | 70 | 79 | 90 | |
| 10 | 24 | 27 | 31 | 33 | 36 | 42 | 41 | 46 | 53 | 49 | 56 | 63 | 57 | 65 | 74 | 65 | 73 | 83 | 72 | 81 | 92 | 92 | |
| 20 | 25 | 28 | 32 | 34 | 38 | 44 | 42 | 47 | 54 | 51 | 57 | 65 | 59 | 66 | 75 | 66 | 74 | 85 | 73 | 82 | 93 | 93 | |
| 30 | 26 | 29 | 33 | 35 | 39 | 44 | 43 | 49 | 55 | 52 | 58 | 66 | 60 | 67 | 77 | 68 | 76 | 86 | 74 | 83 | 95 | 95 | |
| 40 | 26 | 29 | 33 | 36 | 40 | 45 | 44 | 50 | 56 | 53 | 59 | 67 | 61 | 69 | 78 | 69 | 77 | 87 | 75 | 84 | 96 | 96 | |
| 50 | 27 | 30 | 34 | 36 | 41 | 46 | 45 | 51 | 57 | 54 | 60 | 68 | 62 | 70 | 79 | 70 | 78 | 88 | 76 | 85 | 96 | 96 | |
| 4 | 0 | 28 | 31 | 35 | 37 | 41 | 47 | 46 | 52 | 58 | 55 | 61 | 69 | 63 | 70 | 79 | 71 | 79 | 89 | 77 | 86 | 97 | |
| 10 | 28 | 31 | 35 | 38 | 42 | 47 | 47 | 52 | 59 | 56 | 62 | 70 | 64 | 71 | 80 | 71 | 79 | 89 | 78 | 86 | 97 | 97 | |
| 20 | 29 | 32 | 36 | 38 | 42 | 48 | 47 | 53 | 59 | 56 | 62 | 70 | 64 | 71 | 80 | 72 | 80 | 89 | 78 | 87 | 97 | 97 | |
| 30 | 29 | 32 | 36 | 39 | 43 | 48 | 48 | 53 | 60 | 57 | 63 | 71 | 65 | 72 | 81 | 72 | 80 | 90 | 79 | 87 | 97 | 97 | |
| 40 | 29 | 33 | 37 | 39 | 43 | 49 | 48 | 53 | 60 | 57 | 63 | 71 | 65 | 72 | 81 | 72 | 80 | 89 | 79 | 87 | 97 | 97 | |
| 50 | 30 | 33 | 37 | 39 | 44 | 49 | 48 | 54 | 60 | 57 | 63 | 71 | 65 | 72 | 81 | 72 | 80 | 89 | 79 | 87 | 96 | 96 | |
| 5 | 0 | 30 | 33 | 37 | 39 | 44 | 49 | 49 | 54 | 60 | 57 | 63 | 71 | 65 | 72 | 80 | 72 | 80 | 89 | 78 | 86 | 95 | |
| 10 | 30 | 33 | 37 | 40 | 44 | 49 | 49 | 54 | 60 | 57 | 63 | 71 | 65 | 72 | 80 | 72 | 79 | 88 | 78 | 86 | 95 | 95 | |
| 20 | 30 | 33 | 37 | 40 | 44 | 49 | 49 | 54 | 60 | 57 | 63 | 71 | 65 | 71 | 79 | 72 | 79 | 88 | 78 | 85 | 94 | 94 | |
| 30 | 30 | 33 | 37 | 40 | 44 | 49 | 49 | 54 | 60 | 57 | 63 | 70 | 64 | 71 | 79 | 71 | 78 | 87 | 77 | 85 | 93 | 93 | |
| 40 | 30 | 33 | 37 | 39 | 44 | 49 | 48 | 53 | 59 | 56 | 62 | 70 | 64 | 70 | 78 | 70 | 77 | 86 | 76 | 84 | 91 | 91 | |
| 50 | 30 | 33 | 37 | 39 | 43 | 48 | 48 | 53 | 59 | 56 | 61 | 69 | 63 | 70 | 77 | 70 | 77 | 85 | 75 | 83 | 90 | 90 | |
| 6 | 0 | 30 | 33 | 37 | 39 | 43 | 48 | 48 | 52 | 58 | 55 | 61 | 68 | 63 | 69 | 76 | 69 | 76 | 84 | 74 | 82 | 89 | |
| 10 | 30 | 33 | 37 | 39 | 43 | 47 | 47 | 52 | 58 | 55 | 60 | 67 | 62 | 68 | 75 | 68 | 75 | 82 | 73 | 80 | 87 | 87 | |
| 20 | 29 | 32 | 36 | 38 | 42 | 47 | 47 | 51 | 57 | 54 | 60 | 66 | 61 | 67 | 74 | 67 | 73 | 81 | 72 | 79 | 85 | 85 | |
| 30 | 29 | 32 | 36 | 38 | 42 | 46 | 46 | 51 | 56 | 53 | 59 | 65 | 60 | 66 | 73 | 66 | 72 | 80 | 71 | 78 | 84 | 84 | |
| 40 | 29 | 32 | 35 | 37 | 41 | 46 | 45 | 50 | 55 | 53 | 58 | 64 | 59 | 65 | 71 | 65 | 71 | 78 | 70 | 76 | 82 | 82 | |
| 50 | 28 | 31 | 35 | 37 | 40 | 45 | 45 | 49 | 54 | 52 | 57 | 62 | 58 | 63 | 70 | 63 | 69 | 76 | 68 | 74 | 80 | 80 | |
| 7 | 0 | 28 | 31 | 34 | 36 | 40 | 44 | 44 | 48 | 53 | 51 | 55 | 61 | 57 | 62 | 68 | 62 | 68 | 75 | 67 | 73 | 78 | |
| 10 | 27 | 30 | 34 | 35 | 39 | 43 | 43 | 47 | 52 | 50 | 54 | 60 | 56 | 61 | 67 | 61 | 66 | 73 | 65 | 71 | 76 | 76 | |
| 20 | 27 | 30 | 33 | 35 | 38 | 42 | 42 | 46 | 51 | 48 | 53 | 58 | 54 | 59 | 65 | 59 | 65 | 71 | 64 | 69 | 74 | 74 | |
| 30 | 26 | 29 | 32 | 34 | 37 | 41 | 41 | 45 | 49 | 47 | 52 | 57 | 53 | 58 | 63 | 58 | 63 | 69 | 62 | 67 | 71 | 71 | |
| 40 | 26 | 28 | 31 | 33 | 36 | 40 | 40 | 44 | 48 | 46 | 50 | 55 | 51 | 56 | 62 | 56 | 61 | 67 | | | | | |
| 50 | 25 | 27 | 31 | 32 | 35 | 39 | 39 | 42 | 47 | 45 | 49 | 53 | 50 | 54 | 60 | 54 | 59 | 65 | | | | | |
| 8 | 0 | 24 | 27 | 30 | 31 | 34 | 38 | 38 | 41 | 45 | 43 | 47 | 52 | 48 | 52 | 58 | 53 | 57 | 63 | | | | |
| 10 | 24 | 26 | 29 | 30 | 33 | 37 | 36 | 40 | 44 | 42 | 46 | 50 | 47 | 51 | 56 | 52 | 55 | 60 | | | | | |
| 20 | 23 | 25 | 28 | 29 | 32 | 35 | 35 | 38 | 42 | 40 | 44 | 48 | 45 | 49 | 54 | | | | | | | | |
| 30 | 22 | 24 | 27 | 28 | 31 | 34 | 34 | 37 | 41 | 39 | 42 | 46 | 43 | 47 | 52 | | | | | | | | |
| 40 | 21 | 23 | 26 | 27 | 30 | 33 | 33 | 35 | 39 | 37 | 41 | 44 | 41 | 45 | 49 | | | | | | | | |
| 50 | 20 | 22 | 25 | 26 | 28 | 31 | 31 | 34 | 37 | 36 | 39 | 42 | 40 | 43 | 47 | | | | | | | | |
| 9 | 0 | 19 | 21 | 24 | 25 | 27 | 30 | 30 | 32 | 35 | 34 | 37 | 40 | | | | | | | | | | |
| 10 | 18 | 20 | 22 | 24 | 26 | 28 | 28 | 31 | 34 | 32 | 35 | 38 | | | | | | | | | | | |
| 20 | 18 | 19 | 21 | 22 | 24 | 27 | 27 | 29 | 32 | 31 | 33 | 36 | | | | | | | | | | | |
| 30 | 16 | 18 | 20 | 21 | 23 | 25 | 25 | 27 | 30 | 29 | 31 | 34 | | | | | | | | | | | |
| 40 | 15 | 17 | 19 | 20 | 22 | 24 | 24 | 26 | 28 | 27 | 29 | 32 | | | | | | | | | | | |

(Concluded at bottom of next page.)

DOWNES'S TABLE GIVING VALUES OF τ .
FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

| A | Lat. 30° | | | Lat. 24° | | | Lat. 18° | | | Lat. 12° | | | Lat. 6° | | | Lat. 0° | | |
|-----|----------|-----|-----|----------|-----|-----|----------|-----|-----|----------|-----|-----|---------|-----|-----|---------|-----|-----|
| | z' | | | z' | | | z' | | | z' | | | z' | | | z' | | |
| | .62 | .56 | .50 | .62 | .56 | .50 | .62 | .56 | .50 | .62 | .56 | .50 | .62 | .56 | .50 | .62 | .56 | .50 |
| h m | m | m | m | m | m | m | m | m | m | m | m | m | m | m | m | m | m | m |
| 0 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 6 | 7 | 8 | 7 | 7 | 9 | 7 | 8 | 9 | 7 | 8 | 10 | 7 | 8 | 10 | 8 | 9 | 11 |
| 20 | 12 | 14 | 16 | 13 | 14 | 18 | 14 | 16 | 19 | 14 | 16 | 20 | 14 | 17 | 21 | 15 | 18 | 21 |
| 30 | 17 | 20 | 24 | 19 | 22 | 27 | 20 | 24 | 29 | 21 | 25 | 30 | 21 | 25 | 31 | 22 | 26 | 32 |
| 40 | 23 | 27 | 32 | 25 | 29 | 36 | 26 | 32 | 39 | 24 | 33 | 40 | 28 | 34 | 41 | 29 | 34 | 42 |
| 50 | 28 | 33 | 40 | 31 | 36 | 44 | 32 | 39 | 48 | 35 | 40 | 50 | 35 | 42 | 51 | 35 | 42 | 52 |
| 1 0 | 33 | 39 | 47 | 36 | 42 | 52 | 38 | 46 | 56 | 40 | 47 | 59 | 41 | 49 | 60 | 41 | 49 | 61 |
| 10 | 38 | 45 | 54 | 41 | 48 | 59 | 44 | 52 | 63 | 46 | 54 | 67 | 47 | 56 | 68 | 47 | 56 | 69 |
| 20 | 43 | 50 | 60 | 46 | 54 | 65 | 49 | 58 | 70 | 52 | 60 | 74 | 53 | 62 | 75 | 53 | 63 | 76 |
| 30 | 48 | 55 | 66 | 51 | 60 | 71 | 54 | 64 | 76 | 57 | 66 | 79 | 58 | 68 | 81 | 59 | 69 | 82 |
| 40 | 52 | 60 | 71 | 56 | 65 | 77 | 59 | 69 | 82 | 62 | 72 | 84 | 63 | 73 | 87 | 64 | 74 | 88 |
| 50 | 56 | 64 | 76 | 60 | 69 | 82 | 64 | 74 | 87 | 66 | 77 | 89 | 68 | 78 | 92 | 68 | 79 | 93 |
| 2 0 | 59 | 68 | 80 | 64 | 73 | 86 | 68 | 78 | 91 | 70 | 81 | 95 | 72 | 83 | 97 | 72 | 83 | 98 |
| 10 | 62 | 72 | 84 | 67 | 77 | 90 | 71 | 81 | 95 | 74 | 85 | 99 | 75 | 87 | 101 | 76 | 87 | 102 |
| 20 | 65 | 75 | 87 | 70 | 81 | 94 | 74 | 85 | 99 | 77 | 88 | 103 | 78 | 90 | 105 | 79 | 91 | 106 |
| 30 | 68 | 78 | 90 | 73 | 84 | 97 | 77 | 88 | 102 | 80 | 91 | 106 | 81 | 93 | 108 | 82 | 94 | 109 |
| 40 | 71 | 81 | 93 | 76 | 87 | 100 | 80 | 91 | 105 | 83 | 94 | 109 | 84 | 96 | 111 | 85 | 97 | 112 |
| 50 | 74 | 83 | 96 | 78 | 89 | 102 | 82 | 93 | 107 | 85 | 96 | 111 | 87 | 98 | 113 | 87 | 99 | 114 |
| 3 0 | 76 | 85 | 98 | 80 | 91 | 104 | 84 | 95 | 109 | 87 | 98 | 113 | 89 | 100 | 115 | 89 | 101 | 116 |
| 10 | 77 | 87 | 99 | 82 | 92 | 106 | 86 | 97 | 111 | 89 | 100 | 114 | 91 | 102 | 116 | 91 | 103 | 117 |
| 20 | 79 | 89 | 101 | 84 | 94 | 107 | 88 | 99 | 112 | 91 | 102 | 115 | 92 | 104 | 118 | 93 | 104 | 118 |
| 30 | 80 | 90 | 102 | 85 | 95 | 108 | 89 | 100 | 113 | 92 | 103 | 116 | 94 | 105 | 119 | 94 | 105 | 119 |
| 40 | 81 | 91 | 103 | 86 | 96 | 109 | 90 | 101 | 114 | 93 | 104 | 117 | 95 | 106 | 119 | 95 | 106 | 120 |
| 50 | 82 | 92 | 104 | 87 | 97 | 110 | 91 | 101 | 114 | 94 | 104 | 118 | 95 | 106 | 120 | 96 | 107 | 120 |
| 4 0 | 83 | 92 | 104 | 88 | 98 | 110 | 92 | 102 | 114 | 94 | 105 | 118 | 96 | 107 | 120 | 97 | 107 | 120 |
| 10 | 84 | 93 | 104 | 88 | 98 | 110 | 92 | 102 | 114 | 95 | 105 | 118 | 96 | 107 | 120 | 97 | 107 | 120 |
| 20 | 84 | 93 | 104 | 89 | 98 | 110 | 92 | 102 | 114 | 95 | 105 | 117 | 96 | 107 | 119 | 97 | 107 | 120 |
| 30 | 84 | 93 | 104 | 89 | 98 | 110 | 92 | 102 | 114 | 95 | 105 | 117 | 96 | 107 | 119 | 97 | 107 | 119 |
| 40 | 84 | 93 | 104 | 89 | 98 | 109 | 92 | 102 | 113 | 95 | 104 | 116 | 96 | 106 | 118 | 97 | 107 | 119 |
| 50 | 84 | 93 | 103 | 88 | 97 | 108 | 92 | 101 | 113 | 94 | 104 | 115 | 96 | 106 | 117 | 96 | 106 | 118 |
| 5 0 | 84 | 92 | 102 | 88 | 97 | 108 | 91 | 101 | 112 | 94 | 103 | 114 | 95 | 105 | 116 | 96 | 105 | 117 |
| 10 | 83 | 92 | 102 | 88 | 96 | 107 | 91 | 100 | 110 | 93 | 102 | 113 | 95 | 104 | 115 | 95 | 104 | 115 |
| 20 | 83 | 91 | 101 | 87 | 95 | 106 | 90 | 99 | 109 | 92 | 101 | 112 | 94 | 103 | 114 | 94 | 103 | 114 |
| 30 | 82 | 90 | 100 | 86 | 94 | 104 | 89 | 98 | 108 | 92 | 100 | 111 | 93 | 102 | 112 | 93 | 102 | 113 |
| 40 | 81 | 89 | 98 | 85 | 93 | 103 | 88 | 97 | 106 | 91 | 99 | 109 | 92 | 100 | 110 | | | |
| 50 | 80 | 88 | 97 | 84 | 92 | 101 | 87 | 95 | 105 | 89 | 97 | 107 | | | | | | |
| 6 0 | 79 | 87 | 95 | 83 | 91 | 100 | 86 | 94 | 103 | 88 | 96 | 105 | | | | | | |
| 10 | 78 | 85 | 94 | 82 | 89 | 98 | 84 | 92 | 101 | | | | | | | | | |
| 20 | 77 | 84 | 92 | 80 | 88 | 96 | 82 | 91 | 99 | | | | | | | | | |
| 30 | 75 | 82 | 90 | 79 | 86 | 94 | | | | | | | | | | | | |
| 40 | 74 | 81 | 88 | 77 | 84 | 92 | | | | | | | | | | | | |
| 50 | 72 | 79 | 86 | | | | | | | | | | | | | | | |
| 7 0 | 71 | 77 | 84 | | | | | | | | | | | | | | | |

(Concluded from preceding page.)

| A | | | Lat. 72° | | | Lat. 66° | | | Lat. 60° | | | A | | | Lat. 72° | | | Lat. 66° | | | Lat. 60° | | | |
|----|----|--|----------|-----|-----|----------|-----|-----|----------|-----|-----|---|----|---|----------|-----|-----|----------|-----|-----|----------|-----|-----|----|
| | | | x' | | | x' | | | x' | | | | | | x' | | | x' | | | x' | | | |
| | | | .62 | .56 | .50 | .62 | .56 | .50 | .62 | .56 | .50 | | | | .62 | .56 | .50 | .62 | .56 | .50 | .62 | .56 | .50 | |
| h | m | | m | m | m | m | m | m | m | m | m | m | h | m | | m | m | m | m | m | m | m | m | |
| 9 | 50 | | 14 | 16 | 18 | 18 | 20 | 22 | 22 | 24 | 26 | | 11 | 0 | | 7 | 8 | 8 | 9 | 10 | 11 | 10 | 11 | 12 |
| 10 | 0 | | 13 | 15 | 16 | 17 | 19 | 21 | 20 | 22 | 24 | | 10 | | | 6 | 6 | 7 | 7 | 8 | 9 | 9 | 9 | 10 |
| | 10 | | 12 | 14 | 15 | 16 | 17 | 19 | 19 | 21 | 22 | | 20 | | | 5 | 5 | 6 | 6 | 6 | 7 | 7 | 8 | 8 |
| | 20 | | 11 | 12 | 14 | 15 | 16 | 17 | 17 | 19 | 20 | | 30 | | | 3 | 4 | 4 | 4 | 5 | 5 | | | |
| | 30 | | 10 | 11 | 12 | 13 | 14 | 16 | 16 | 17 | 18 | | 40 | | | 2 | 3 | 3 | 3 | 3 | 4 | | | |
| | 40 | | 9 | 10 | 11 | 12 | 13 | 14 | 14 | 15 | 16 | | 50 | | | 1 | 1 | 1 | 1 | 2 | 2 | | | |
| | 50 | | 8 | 9 | 10 | 10 | 11 | 12 | 12 | 13 | 14 | | 12 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | | |

FOR WASHINGTON MEAN NOON.

| Date. | k | i | θ | L | Date. | k | i | θ | L |
|--------|-------|-------|----------|------|---------|-------|-------|----------|------|
| Jan. 1 | 0.518 | 99.4 | 348.9 | 58.4 | July 5 | 0.996 | 7.2 | 218.6 | 65.9 |
| 6 | 0.181 | 129.6 | 343.4 | 36.6 | 10 | 0.985 | 14.0 | 347.3 | 58.3 |
| 11 | 0.020 | 163.9 | 320.9 | 4.8 | 15 | 0.936 | 29.3 | 2.6 | 49.2 |
| 16 | 0.041 | 156.8 | 198.6 | 9.4 | 20 | 0.872 | 41.9 | 9.8 | 41.7 |
| 21 | 0.190 | 128.4 | 184.8 | 32.2 | 25 | 0.807 | 52.2 | 14.8 | 36.5 |
| 26 | 0.358 | 106.6 | 180.3 | 42.1 | 30 | 0.743 | 60.9 | 18.5 | 33.3 |
| 31 | 0.497 | 90.3 | 176.5 | 41.3 | Aug. 4 | 0.681 | 68.7 | 21.5 | 31.6 |
| Feb. 5 | 0.603 | 78.1 | 172.8 | 37.3 | 9 | 0.618 | 76.4 | 23.9 | 31.1 |
| 10 | 0.685 | 68.3 | 168.8 | 33.5 | 14 | 0.549 | 84.9 | 26.0 | 31.0 |
| 15 | 0.745 | 60.6 | 165.1 | 30.6 | 19 | 0.471 | 93.3 | 28.0 | 31.7 |
| 20 | 0.796 | 53.7 | 161.2 | 28.9 | 24 | 0.380 | 103.9 | 30.1 | 31.7 |
| 25 | 0.840 | 47.2 | 157.5 | 28.3 | 29 | 0.274 | 116.9 | 32.8 | 29.2 |
| Mar. 2 | 0.879 | 40.7 | 153.7 | 28.8 | Sept. 3 | 0.149 | 134.7 | 37.7 | 20.7 |
| 7 | 0.915 | 33.9 | 150.1 | 30.6 | 8 | 0.050 | 154.2 | 48.2 | 8.8 |
| 12 | 0.950 | 26.0 | 145.9 | 34.0 | 13 | 0.007 | 170.6 | 130.3 | 1.4 |
| 17 | 0.979 | 16.5 | 139.5 | 39.5 | 18 | 0.076 | 148.0 | 193.4 | 15.2 |
| 22 | 0.998 | 5.5 | 109.0 | 47.4 | 23 | 0.261 | 118.6 | 202.4 | 44.9 |
| 27 | 0.969 | 12.0 | 347.8 | 57.5 | 28 | 0.494 | 90.7 | 206.5 | 65.4 |
| Apr. 1 | 0.931 | 30.5 | 337.1 | 66.8 | Oct. 3 | 0.705 | 65.8 | 209.3 | 67.7 |
| 6 | 0.808 | 52.0 | 335.1 | 70.0 | 8 | 0.852 | 45.2 | 211.4 | 58.4 |
| 11 | 0.637 | 74.1 | 335.2 | 63.9 | 13 | 0.936 | 29.3 | 212.9 | 47.2 |
| 16 | 0.458 | 94.8 | 335.8 | 52.0 | 18 | 0.978 | 16.9 | 214.6 | 38.3 |
| 21 | 0.297 | 113.9 | 336.4 | 38.0 | 23 | 0.996 | 7.3 | 218.7 | 32.1 |
| 26 | 0.168 | 131.7 | 336.5 | 24.2 | 28 | 1.000 | 1.6 | 334.3 | 28.1 |
| May 1 | 0.068 | 149.8 | 336.2 | 10.9 | Nov. 2 | 0.996 | 7.6 | 20.1 | 25.8 |
| 6 | 0.011 | 167.8 | 336.5 | 2.0 | 7 | 0.986 | 13.8 | 20.0 | 24.7 |
| 11 | 0.002 | 174.2 | 148.8 | 0.4 | 12 | 0.970 | 19.8 | 20.2 | 24.8 |
| 16 | 0.038 | 157.5 | 151.9 | 6.2 | 17 | 0.949 | 26.1 | 17.8 | 25.9 |
| 21 | 0.105 | 142.2 | 152.5 | 14.9 | 22 | 0.919 | 33.0 | 14.8 | 28.4 |
| 26 | 0.188 | 128.6 | 153.5 | 22.9 | 27 | 0.877 | 41.1 | 11.3 | 32.3 |
| 31 | 0.279 | 116.3 | 154.9 | 29.1 | Dec. 2 | 0.814 | 51.1 | 7.5 | 38.2 |
| June 5 | 0.376 | 104.4 | 156.9 | 34.4 | 7 | 0.720 | 63.9 | 3.7 | 46.1 |
| 10 | 0.477 | 92.6 | 159.6 | 39.4 | 12 | 0.578 | 81.0 | 0.0 | 54.0 |
| 15 | 0.593 | 79.3 | 163.2 | 46.0 | 17 | 0.379 | 104.0 | 356.4 | 53.8 |
| 20 | 0.715 | 64.5 | 167.7 | 53.7 | 22 | 0.152 | 134.1 | 351.8 | 31.6 |
| 25 | 0.842 | 47.8 | 174.0 | 62.1 | 27 | 0.011 | 167.9 | 319.6 | 2.8 |
| 30 | 0.946 | 26.9 | 183.9 | 67.5 | 32 | 0.064 | 150.7 | 196.8 | 14.5 |

NOTATION.

k , the ratio of the illuminated portion of the apparent disk to the entire apparent disk considered as the superficies of a circle.

i , the angle between the sun and earth, as seen from the planet.

θ , the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L , the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR WASHINGTON MEAN NOON.

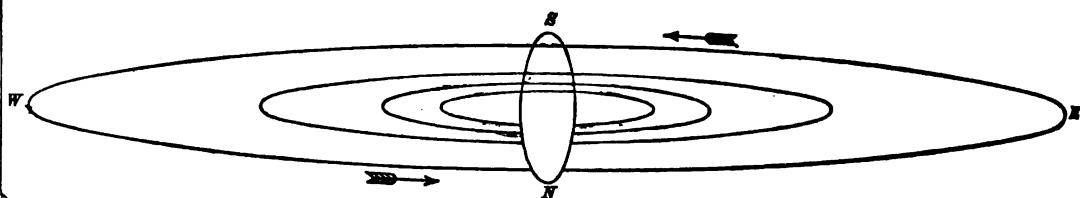
| Date. | <i>k</i> | <i>i</i> | θ | <i>L</i> | Date. | <i>k</i> | <i>i</i> | θ | <i>L</i> |
|--------|----------|----------|----------|----------|---------|----------|----------|----------|----------|
| Jan. 1 | 0.198 | 127.1 | 196.0 | 210.0 | July 5 | 0.937 | 29.1 | 175.5 | 52.2 |
| 6 | 0.243 | 120.9 | 195.0 | 218.3 | 10 | 0.945 | 27.1 | 178.6 | 51.5 |
| 11 | 0.286 | 115.4 | 193.7 | 217.6 | 15 | 0.952 | 25.2 | 181.8 | 50.9 |
| 16 | 0.325 | 110.5 | 192.0 | 211.7 | 20 | 0.960 | 23.2 | 185.2 | 50.4 |
| 21 | 0.362 | 106.0 | 190.1 | 202.7 | 25 | 0.966 | 21.3 | 188.5 | 49.9 |
| 26 | 0.396 | 102.0 | 188.1 | 192.2 | 30 | 0.972 | 19.3 | 191.8 | 49.5 |
| 31 | 0.428 | 98.3 | 185.9 | 181.0 | Aug. 4 | 0.977 | 17.4 | 195.2 | 49.1 |
| Feb. 5 | 0.458 | 94.9 | 183.6 | 170.1 | 9 | 0.982 | 15.4 | 198.6 | 48.7 |
| 10 | 0.485 | 91.7 | 181.2 | 159.6 | 14 | 0.986 | 13.5 | 202.1 | 48.4 |
| 15 | 0.512 | 88.7 | 178.8 | 149.9 | 19 | 0.990 | 11.6 | 205.8 | 48.2 |
| 20 | 0.535 | 85.8 | 176.3 | 140.8 | 24 | 0.993 | 9.7 | 209.8 | 48.0 |
| 25 | 0.560 | 83.1 | 173.8 | 132.3 | 29 | 0.995 | 7.8 | 214.1 | 47.8 |
| Mar. 2 | 0.582 | 80.5 | 171.3 | 124.6 | Sept. 3 | 0.997 | 6.0 | 220.3 | 47.6 |
| 7 | 0.604 | 78.0 | 168.9 | 117.6 | 8 | 0.999 | 4.3 | 230.4 | 47.5 |
| 12 | 0.624 | 75.6 | 166.6 | 111.2 | 13 | 0.999 | 2.6 | 250.2 | 47.5 |
| 17 | 0.644 | 73.3 | 164.5 | 105.3 | 18 | 1.000 | 1.9 | 294.4 | 47.4 |
| 22 | 0.662 | 71.1 | 162.5 | 99.8 | 23 | 1.000 | 2.4 | 338.8 | 47.4 |
| 27 | 0.680 | 68.9 | 160.7 | 95.1 | 28 | 0.999 | 4.1 | 358.1 | 47.4 |
| Apr. 1 | 0.698 | 66.7 | 159.1 | 90.7 | Oct. 3 | 0.998 | 5.7 | 6.2 | 47.5 |
| 6 | 0.715 | 64.6 | 157.7 | 86.6 | 8 | 0.996 | 7.5 | 10.8 | 47.7 |
| 11 | 0.730 | 62.5 | 156.5 | 82.8 | 13 | 0.994 | 9.3 | 13.3 | 47.8 |
| 16 | 0.747 | 60.4 | 155.6 | 79.5 | 18 | 0.991 | 11.0 | 14.4 | 48.0 |
| 21 | 0.762 | 58.4 | 155.0 | 76.4 | 23 | 0.988 | 12.7 | 14.9 | 48.3 |
| 26 | 0.776 | 56.4 | 154.6 | 73.5 | 28 | 0.984 | 14.4 | 14.8 | 48.6 |
| May 1 | 0.791 | 54.4 | 154.3 | 70.9 | Nov. 2 | 0.980 | 16.1 | 14.1 | 48.9 |
| 6 | 0.805 | 52.4 | 154.4 | 68.6 | 7 | 0.976 | 17.8 | 13.0 | 49.2 |
| 11 | 0.818 | 50.5 | 154.9 | 66.4 | 12 | 0.971 | 19.5 | 11.6 | 49.7 |
| 16 | 0.831 | 48.6 | 155.5 | 64.4 | 17 | 0.966 | 21.2 | 9.8 | 50.2 |
| 21 | 0.843 | 46.6 | 156.4 | 62.6 | 22 | 0.961 | 22.8 | 7.8 | 50.7 |
| 26 | 0.856 | 44.7 | 157.6 | 61.0 | 27 | 0.955 | 24.5 | 5.6 | 51.3 |
| 31 | 0.867 | 42.8 | 159.0 | 59.5 | Dec. 2 | 0.949 | 26.1 | 3.3 | 51.9 |
| June 5 | 0.879 | 40.8 | 160.6 | 58.2 | 7 | 0.943 | 27.7 | 0.8 | 52.7 |
| 10 | 0.890 | 38.8 | 162.5 | 57.0 | 12 | 0.936 | 29.4 | 358.3 | 53.5 |
| 15 | 0.900 | 36.9 | 164.7 | 55.8 | 17 | 0.928 | 31.1 | 355.8 | 54.4 |
| 20 | 0.910 | 34.9 | 167.1 | 54.7 | 22 | 0.921 | 32.7 | 353.4 | 55.4 |
| 25 | 0.919 | 33.0 | 169.7 | 53.8 | 27 | 0.912 | 34.4 | 351.0 | 56.4 |
| 30 | 0.928 | 31.1 | 172.5 | 53.0 | 32 | 0.904 | 36.1 | 348.8 | 57.5 |

Mars not being in opposition during the year 1891, the satellites will not be visible.

APPARENT DISK OF MARS.

| | | |
|-----------|-----|-------|
| January | 1, | 0.897 |
| January | 31, | 0.921 |
| March | 2, | 0.943 |
| April | 1, | 0.962 |
| May | 1, | 0.978 |
| May | 31, | 0.990 |
| June | 30, | 0.998 |
| July | 30, | 1.000 |
| August | 29, | 0.996 |
| September | 28, | 0.989 |
| October | 28, | 0.976 |
| November | 27, | 0.959 |
| December | 27, | 0.943 |

The numbers in this table are the versed sines of the illuminated disk, the apparent diameter of the planet being taken as unity.



**APPARENT ORBITS OF THE SATELLITES OF JUPITER IN 1891,
AS SEEN IN AN INVERTING TELESCOPE.**

(THE VERTICAL SCALE IS THREE TIMES THE HORIZONTAL ONE.)

The object of this figure is to facilitate the identification of the satellites in cases where the diagrams of configurations do not suffice for that purpose: reference to the above diagram enables one to identify the inner and outer satellite of the pair. The central, vertical ellipse represents the disk of Jupiter, elongated three times in the vertical direction to correspond to the representation of the orbits of the satellites.

Facing each page of the phenomena of Jupiter's satellites, pages 452—473, is the page of diagrams of configurations, for the same month. The light disks ○ in the vertical row in the middle of the page represent the relative position of Jupiter each day. The dots adjacent in the same horizontal space represent the positions of the several satellites on the same day, at the hour and minute of Washington mean time indicated above the diagrams. The latitudes of the satellites are always considered zero in constructing the diagrams, except where two or more satellites chance to be at nearly the same distance from the planet, when they are placed one above the other according to their apparent latitudes. The numerals designating the satellites are placed on the right or left hand side of the dot, according as the motion of the satellite, for the time of the configuration, is toward the east or toward the west—the motion being always toward the numeral. Frequently, at the epoch of the configuration, one or more satellites will be invisible, being projected on the disk of the planet: this phenomenon is indicated by a light disk ○ at the left hand side of the page. Frequently, also, one or more satellites will be invisible, being concealed in occultation behind the disk, or eclipsed in the shadow of the planet: this phenomenon is indicated by a dark disk ● at the right hand side of the page. In both cases, the annexed numeral serves to point out which satellite is thus rendered invisible.

When an observation is made at a different hour from that for which the diagram is constructed, the motion of the satellite during the interval may be judged by transferring its given position to the above diagram, and estimating its motion during the elapsed interval on the above diagram of the orbits, by means of the following table of the periods:—

MEAN SYNODIC PERIODS OF THE SATELLITES.

| | d | h | m | s | d |
|------|----|----|----|--------|---------------|
| I. | 1 | 18 | 28 | 35.945 | = 1.76986048 |
| II. | 3 | 13 | 17 | 53.735 | = 3.55409416 |
| III. | 7 | 3 | 59 | 35.854 | = 7.16638720 |
| IV. | 16 | 18 | 5 | 6.928 | = 16.75355241 |

WASHINGTON MEAN TIMES OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

| | | h m | | | | h m | | | | h m | | | | h m | | | |
|-------|----|-----|------|------|----|-----|------|-------|----|-----|------|------|----|-----|------|--|--|
| Jan. | 2 | 9 | 4.8 | May | 15 | 4 | 47.8 | Aug. | 1 | 1 | 16.5 | Oct. | 17 | 20 | 32.6 | | |
| | 4 | 3 | 35.3 | | 16 | 23 | 17.0 | | 2 | 19 | 42.8 | | 19 | 14 | 59.6 | | |
| | 5 | 22 | 5.8 | | 18 | 17 | 46.1 | | 4 | 14 | 9.3 | | 21 | 9 | 26.9 | | |
| | 7 | 16 | 36.2 | | 20 | 12 | 15.2 | | 6 | 8 | 35.7 | | 23 | 3 | 54.2 | | |
| | 9 | 11 | 6.6 | | 22 | 6 | 44.3 | | 8 | 3 | 2.1 | | 24 | 22 | 21.6 | | |
| | | | | | | | | | | | | | | | | | |
| | 11 | 5 | 36.9 | | 24 | 1 | 13.3 | | 9 | 21 | 28.3 | | 26 | 16 | 49.1 | | |
| | 13 | 0 | 7.2 | | 26 | 19 | 42.3 | | 11 | 15 | 54.5 | | 28 | 11 | 16.6 | | |
| March | 10 | 16 | 22.2 | | 27 | 14 | 11.1 | | 13 | 10 | 20.7 | | 30 | 5 | 44.0 | | |
| | 12 | 10 | 52.6 | | 29 | 8 | 40.0 | | 15 | 4 | 46.9 | Nov. | 1 | 0 | 11.8 | | |
| | 14 | 5 | 22.9 | | 31 | 3 | 8.7 | | 16 | 23 | 12.9 | | 2 | 16 | 39.5 | | |
| | | | | | | | | | | | | | | | | | |
| | 15 | 23 | 53.2 | June | 1 | 21 | 37.5 | | 18 | 17 | 39.1 | | 4 | 13 | 7.4 | | |
| | 17 | 18 | 23.4 | | 3 | 16 | 6.1 | | 20 | 12 | 5.1 | | 6 | 7 | 35.2 | | |
| | 19 | 12 | 53.7 | | 5 | 10 | 34.9 | | 22 | 6 | 31.3 | | 8 | 2 | 3.2 | | |
| | 21 | 7 | 24.0 | | 7 | 5 | 3.3 | | 24 | 0 | 57.2 | | 9 | 20 | 31.2 | | |
| | 23 | 1 | 54.3 | | 8 | 23 | 31.9 | | 25 | 19 | 23.3 | | 11 | 14 | 59.4 | | |
| | | | | | | | | | | | | | | | | | |
| | 24 | 20 | 24.5 | | 10 | 18 | 0.2 | | 27 | 13 | 49.3 | | 13 | 9 | 27.5 | | |
| | 26 | 14 | 54.6 | | 12 | 12 | 28.6 | | 29 | 8 | 15.4 | | 15 | 3 | 55.9 | | |
| | 28 | 9 | 24.8 | | 14 | 6 | 56.8 | | 31 | 2 | 41.2 | | 16 | 22 | 24.2 | | |
| | 30 | 3 | 55.1 | | 16 | 1 | 25.2 | Sept. | 1 | 21 | 7.2 | | 18 | 16 | 52.6 | | |
| | 31 | 22 | 25.2 | | 17 | 19 | 53.4 | | 3 | 15 | 33.1 | | 20 | 11 | 21.1 | | |
| | | | | | | | | | | | | | | | | | |
| April | 2 | 16 | 55.3 | | 19 | 14 | 21.4 | | 5 | 9 | 59.1 | | 22 | 5 | 49.8 | | |
| | 4 | 11 | 25.4 | | 21 | 8 | 49.4 | | 7 | 4 | 25.1 | | 24 | 0 | 18.4 | | |
| | 6 | 5 | 55.4 | | 23 | 3 | 17.4 | | 8 | 22 | 51.1 | | 25 | 18 | 47.1 | | |
| | 8 | 0 | 25.3 | | 24 | 21 | 45.4 | | 10 | 17 | 17.1 | | 27 | 13 | 15.9 | | |
| | 9 | 18 | 55.3 | | 26 | 16 | 13.2 | | 12 | 11 | 43.0 | | 29 | 7 | 44.8 | | |
| | | | | | | | | | | | | | | | | | |
| | 11 | 13 | 25.2 | | 28 | 10 | 41.0 | | 14 | 6 | 9.0 | Dec. | 1 | 2 | 13.7 | | |
| | 13 | 7 | 55.2 | | 30 | 5 | 8.7 | | 16 | 0 | 35.0 | | 2 | 20 | 42.6 | | |
| | 15 | 2 | 25.0 | | 1 | 23 | 36.3 | | 17 | 19 | 1.1 | | 4 | 15 | 11.6 | | |
| | 16 | 20 | 55.0 | July | 3 | 18 | 4.0 | | 19 | 13 | 27.4 | | 6 | 9 | 40.9 | | |
| | 18 | 15 | 24.7 | | 5 | 12 | 31.5 | | 21 | 7 | 53.5 | | 8 | 4 | 10.0 | | |
| | | | | | | | | | | | | | | | | | |
| | 20 | 9 | 54.7 | | 7 | 6 | 59.0 | | 23 | 2 | 19.8 | | 9 | 22 | 39.2 | | |
| | 22 | 4 | 24.3 | | 9 | 1 | 26.4 | | 24 | 20 | 46.1 | | 11 | 17 | 8.4 | | |
| | 23 | 22 | 54.1 | | 10 | 19 | 53.7 | | 26 | 15 | 12.4 | | 13 | 11 | 37.6 | | |
| | 25 | 17 | 23.7 | | 12 | 14 | 20.8 | | 28 | 9 | 38.7 | | 15 | 6 | 7.1 | | |
| | 27 | 11 | 53.4 | | 14 | 8 | 48.0 | | 30 | 4 | 5.1 | | 17 | 0 | 36.5 | | |
| | | | | | | | | | | | | | | | | | |
| May | 29 | 6 | 23.0 | | 16 | 3 | 15.2 | Oct. | 1 | 22 | 31.5 | | 18 | 19 | 6.0 | | |
| | 1 | 0 | 52.7 | | 17 | 21 | 42.3 | | 3 | 16 | 58.2 | | 20 | 13 | 35.5 | | |
| | 2 | 19 | 22.2 | | 19 | 16 | 9.1 | | 5 | 11 | 24.7 | | 22 | 8 | 5.0 | | |
| | 4 | 13 | 51.8 | | 21 | 10 | 36.0 | | 7 | 5 | 61.4 | | 24 | 2 | 34.6 | | |
| | 6 | 8 | 21.2 | | 23 | 5 | 2.8 | | 9 | 0 | 18.0 | | 25 | 21 | 4.3 | | |
| | | | | | | | | | | | | | | | | | |
| | 8 | 2 | 50.7 | | 24 | 23 | 29.8 | | 10 | 18 | 44.8 | | 27 | 15 | 34.2 | | |
| | 9 | 21 | 20.0 | | 26 | 17 | 58.5 | | 12 | 13 | 11.6 | | 29 | 10 | 3.9 | | |
| | 11 | 15 | 49.4 | | 28 | 12 | 23.3 | | 14 | 7 | 38.6 | | 31 | 4 | 33.7 | | |
| | 13 | 10 | 18.6 | | 30 | 6 | 49.9 | | 16 | 2 | 5.5 | | | | | | |

WASHINGTON MEAN TIMES OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

| | | | | | | | | | | | |
|-------|----|-------------------------------------|------|----|-------------------------------------|-------|----|------------------------------------|------|----|-------------------------------------|
| Jan. | 4 | ^h ^m 2 32.0 | May | 12 | ^h ^m 5 33.6 | July | 29 | ^h ^m 9 7.1 | Oct. | 15 | ^h ^m 9 56.8 |
| | 7 | 15 57.5 | | 15 | 18 54.0 | Aug. | 1 | 22 16.1 | | 18 | 23 7.6 |
| | 11 | 5 24.3 | | 19 | 8 14.1 | | 5 | 11 24.7 | | 22 | 12 19.0 |
| | 14 | 18 50.1 | | 22 | 21 33.6 | | 9 | 0 32.8 | | 26 | 1 31.0 |
| | | | | 26 | 10 52.7 | | 12 | 13 40.6 | | 29 | 14 43.6 |
| March | 9 | 4 27.8 | | 30 | 0 11.4 | | 16 | 2 48.0 | Nov. | 2 | 3 57.1 |
| | 12 | 17 53.1 | June | 2 | 13 29.6 | | 19 | 15 55.2 | | 5 | 17 10.8 |
| | 16 | 7 19.1 | | 6 | 2 47.3 | | 23 | 5 2.0 | | 9 | 6 25.6 |
| | 19 | 20 44.1 | | 9 | 16 4.5 | | 26 | 18 8.8 | | 12 | 19 40.7 |
| | 23 | 10 9.7 | | 13 | 5 21.2 | | 30 | 7 15.3 | | 16 | 8 56.6 |
| | | | | 16 | 18 37.4 | Sept. | 2 | 20 21.9 | | 19 | 22 12.9 |
| | 26 | 23 34.4 | | 20 | 7 52.8 | | 6 | 9 28.2 | | 23 | 11 30.2 |
| April | 3 | 12 23.7 | | 23 | 21 7.8 | | 9 | 22 34.9 | | 27 | 0 47.6 |
| | 6 | 15 48.3 | | 27 | 10 22.3 | | 13 | 11 41.6 | | 30 | 14 6.2 |
| | 10 | 5 12.0 | | 30 | 23 36.2 | | 17 | 0 48.7 | Dec. | 4 | 3 24.9 |
| | | | July | 4 | 12 49.3 | | 20 | 13 55.9 | | 7 | 16 44.7 |
| | 13 | 18 36.0 | | 8 | 2 2.3 | | 24 | 3 3.6 | | 11 | 6 4.5 |
| | 17 | 7 59.2 | | 11 | 15 14.5 | | 27 | 16 11.4 | | 14 | 19 25.2 |
| | 20 | 21 22.5 | | 15 | 4 26.1 | Oct. | 1 | 5 19.8 | | 18 | 8 45.9 |
| | 24 | 10 45.0 | | 18 | 17 37.1 | | 4 | 18 28.3 | | 21 | 22 7.7 |
| | 28 | 0 7.6 | | | | | | | | | |
| May | 1 | 13 29.5 | | 22 | 6 47.6 | | 8 | 7 37.3 | | 25 | 11 29.5 |
| | 5 | 2 51.3 | | 25 | 19 57.6 | | 11 | 20 46.9 | | 29 | 0 52.2 |
| | 8 | 16 12.5 | | | | | | | | | |

SATELLITE III.

| | | | | | | | | | | | |
|-------|----|--------------------------------------|------|----|-------------------------------------|-------|----|--------------------------------------|------|----|--------------------------------------|
| Jan. | 5 | ^h ^m 19 37.0 | May | 15 | ^h ^m 3 38.6 | Aug. | 1 | ^h ^m 21 48.2 | Oct. | 19 | ^h ^m 10 35.4 |
| | 13 | 0 6.4 | | 22 | 7 48.9 | | 9 | 1 11.7 | | 26 | 14 11.7 |
| March | 11 | 12 15.2 | | 29 | 11 56.3 | | 16 | 4 31.9 | Nov. | 2 | 17 52.5 |
| | 18 | 16 44.2 | June | 5 | 15 59.5 | | 23 | 7 50.0 | | 9 | 21 38.3 |
| | | | | 12 | 19 58.8 | | 30 | 11 6.3 | | 17 | 1 29.1 |
| | | | | 19 | 23 53.6 | Sept. | 6 | 14 22.4 | | 24 | 5 24.7 |
| April | 2 | 1 39.4 | | 27 | 3 43.8 | | 13 | 17 38.7 | Dec. | 1 | 9 24.7 |
| | 9 | 6 5.4 | July | 4 | 7 29.8 | | 20 | 20 55.8 | | 8 | 13 29.0 |
| | 16 | 10 28.9 | | 11 | 11 11.0 | | 28 | 0 15.0 | | 15 | 17 38.2 |
| | 23 | 14 50.3 | | 18 | 14 48.2 | Oct. | 5 | 3 37.6 | | 22 | 21 50.5 |
| | | | | 25 | 18 20.2 | | 12 | 7 4.3 | | 30 | 2 7.3 |
| May | 30 | 19 9.1 | | | | | | | | | |
| | 7 | 23 25.1 | | | | | | | | | |

SATELLITE IV.

| | | | | | | | | | | | |
|-------|----|--------------------------------------|-------|----|--------------------------------------|-------|----|--------------------------------------|------|----|--------------------------------------|
| Jan. | 2 | ^h ^m 19 23.2 | April | 30 | ^h ^m 20 13.1 | July | 23 | ^h ^m 13 25.5 | Oct. | 14 | ^h ^m 14 21.9 |
| | 19 | 16 9.7 | May | 17 | 15 40.8 | Aug. | 9 | 4 32.0 | | 31 | 6 14.8 |
| March | 11 | 7 2.8 | June | 3 | 10 26.7 | | 25 | 18 57.1 | Nov. | 16 | 23 10.4 |
| | 28 | 3 45.6 | | 20 | 4 23.3 | Sept. | 11 | 9 4.9 | Dec. | 3 | 17 7.6 |
| April | 14 | 0 12.4 | July | 6 | 21 24.1 | | 27 | 23 24.3 | | 20 | 11 58.7 |

WASHINGTON MEAN TIME.

JANUARY.

| d | h | m | s | | d | h | m | s | | d | h | m | s | |
|---|----|----|------|--------------|---|----|----|------|---------------|----|----|----|------|---------------|
| 1 | 10 | 39 | | I. Tr. In. | 5 | 17 | 46 | | III. Oc. Dis. | 9 | 14 | 9 | | III. Sh. Eg. |
| | 11 | 22 | | I. Sh. In. | | 19 | 48 | | II. Tr. In. | 10 | 7 | 11 | | I. Tr. In. |
| | 12 | 59 | | I. Tr. Eg. | | 20 | 56 | | I. Oc. Dis. | | 7 | 47 | | I. Sh. In. |
| | 13 | 42 | | I. Sh. Eg. | | 21 | 8 | | II. Sh. In. | | 9 | 32 | | I. Tr. Eg. |
| 2 | 3 | 32 | | III. Tr. In. | | 22 | 44 | | II. Tr. Eg. | | 10 | 7 | | I. Sh. Eg. |
| | 6 | 23 | | II. Tr. In. | | 23 | 52 | 19.3 | I. Ec. Re. | 11 | 3 | 56 | | II. Oc. Dis. |
| | 6 | 25 | | III. Sh. In. | 6 | 0 | 2 | 49.9 | III. Ec. Re. | | 4 | 27 | | I. Oc. Dis. |
| | 7 | 14 | | III. Tr. Eg. | | 0 | 4 | | II. Sh. Eg. | | 4 | 33 | | IV. Tr. In. |
| | 7 | 50 | | II. Sh. In. | | 18 | 10 | | I. Tr. In. | | 7 | 18 | 24.0 | I. Ec. Re. |
| | 7 | 55 | | I. Oc. Dis. | | 18 | 49 | | I. Sh. In. | | 8 | 0 | 43.1 | II. Ec. Re. |
| | 9 | 19 | | II. Tr. Eg. | | 20 | 30 | | I. Tr. Eg. | | 9 | 28 | | IV. Tr. Eg. |
| | 10 | 7 | | III. Sh. Eg. | | 21 | 9 | | I. Sh. Eg. | | 9 | 50 | | IV. Sh. In. |
| | 10 | 46 | | II. Sh. Eg. | 7 | 14 | 30 | | II. Oc. Dis. | | 14 | 45 | | IV. Sh. Eg. |
| | 10 | 54 | 55.4 | I. Ec. Re. | | 15 | 26 | | I. Oc. Dis. | 12 | 1 | 42 | | I. Tr. In. |
| | 16 | 56 | | IV. Oc. Dis. | | 18 | 21 | 0.2 | I. Ec. Re. | | 2 | 16 | | I. Sh. In. |
| | 21 | 50 | | IV. Oc. Re. | | 18 | 41 | 3.3 | II. Ec. Re. | | 4 | 3 | | I. Tr. Eg. |
| | 23 | 36 | 37.9 | IV. Ec. Dis. | 8 | 12 | 41 | | I. Tr. In. | | 4 | 36 | | I. Sh. Eg. |
| 3 | 4 | 19 | 43.1 | IV. Ec. Re. | | 13 | 18 | | I. Sh. In. | | 22 | 15 | | III. Oc. Dis. |
| | 5 | 9 | | I. Tr. In. | | 15 | 1 | | I. Tr. Eg. | | 22 | 37 | | II. Tr. In. |
| | 5 | 51 | | I. Sh. In. | | 15 | 38 | | I. Sh. Eg. | | 22 | 57 | | I. Oc. Dis. |
| | 7 | 29 | | I. Tr. Eg. | 9 | 8 | 1 | | III. Tr. In. | | 23 | 43 | | II. Sh. In. |
| | 8 | 11 | | I. Sh. Eg. | | 9 | 12 | | II. Tr. In. | 13 | 1 | 33 | | II. Tr. Eg. |
| 4 | 1 | 4 | | II. Oc. Dis. | | 9 | 56 | | I. Oc. Dis. | | 1 | 47 | 4.3 | I. Ec. Re. |
| | 2 | 25 | | I. Oc. Dis. | | 10 | 26 | | II. Sh. In. | | 2 | 40 | | II. Sh. Eg. |
| | 5 | 22 | 29.4 | II. Ec. Re. | | 10 | 27 | | III. Sh. In. | | 4 | 3 | 48.5 | III. Ec. Re. |
| | 5 | 23 | 38.1 | I. Ec. Re. | | 11 | 43 | | III. Tr. Eg. | | 20 | 13 | | I. Tr. In. |
| | 23 | 40 | | I. Tr. In. | | 12 | 8 | | II. Tr. Eg. | | 20 | 44 | | I. Sh. In. |
| 5 | 0 | 20 | | I. Sh. In. | | 12 | 49 | 42.4 | I. Ec. Re. | | 22 | 33 | | I. Tr. Eg. |
| | 2 | 0 | | I. Tr. Eg. | | 13 | 22 | | II. Sh. Eg. | | 23 | 5 | | I. Sh. Eg. |
| | 2 | 40 | | I. Sh. Eg. | | | | | | | | | | |

THE SATELLITES OF JUPITER

ARE INVISIBLE FROM JANUARY 14 UNTIL MARCH 13,

JUPITER BEING TOO NEAR THE SUN.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.



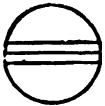
r

III.



r

II.



r

IV.



d

r

Configurations at 5^h for an Inverting Telescope.

| Day. | West. | East. |
|------|-------|---------|
| 1 | 4 | 1 2 3 |
| 2 | 3 | 2 |
| 3 | 3 3 | 1 |
| 4 | 3 | 1 2 3 4 |
| 5 | 3 1 | 2 4 |
| 6 | 2 | 1 4 |
| 7 | 1 | 3 4 |
| 8 | | 1 2 3 4 |
| 9 | 1 | 2 4 |
| 10 | 2 | 1 4 |
| 11 | 4 | 2 1 |
| 12 | 2 | 1 2 |
| 13 | 4 | 1 |
| 14 | 4 | 2 1 |

WASHINGTON MEAN TIME.

MARCH.

THE SATELLITES OF JUPITER

ARE INVISIBLE FROM JANUARY 14 UNTIL MARCH 13,

JUPITER BEING TOO NEAR THE SUN.

| d | h | m | s | | d | h | m | s | | d | h | m | s | | d | h | m | s | |
|----|----|----|------|---------------|----|----|----|------|--------------|----|----|----|------|--|---------------|---|---|---|--|
| 13 | 6 | 33 | | I. Sh. In. | 19 | 14 | 4 | | I. Oc. Re. | 25 | 16 | 36 | 50.0 | | III. Ec. Dis. | | | | |
| | 7 | 3 | | I. Tr. In. | | 15 | 33 | | IV. Sh. Eg. | | 18 | 14 | | | I. Sh. Eg. | | | | |
| | 8 | 53 | | I. Sh. Eg. | | 16 | 22 | | IV. Tr. In. | | 18 | 55 | | | I. Tr. Eg. | | | | |
| | 9 | 23 | | I. Tr. Eg. | | 18 | 4 | 15.8 | II. Ec. Dis. | | 23 | 2 | | | III. Oc. Re. | | | | |
| 14 | 3 | 44 | 34.0 | I. Ec. Dis. | | 21 | 10 | | IV. Tr. Eg. | 26 | 13 | 4 | 18.0 | | I. Ec. Dis. | | | | |
| | 6 | 33 | | I. Oc. Re. | | 22 | 12 | | II. Oc. Re. | | 16 | 5 | | | I. Oc. Re. | | | | |
| | 9 | 40 | | II. Sh. In. | 20 | 8 | 28 | | I. Sh. In. | | 20 | 40 | 59.1 | | II. Ec. Dis. | | | | |
| | 10 | 43 | | II. Tr. In. | | 9 | 4 | | I. Tr. In. | 27 | 1 | 2 | | | II. Oc. Re. | | | | |
| | 12 | 36 | | II. Sh. Eg. | | 10 | 48 | | I. Sh. Eg. | | 10 | 22 | | | I. Sh. In. | | | | |
| | 13 | 40 | | II. Tr. Eg. | | 11 | 24 | | I. Tr. Eg. | | 11 | 5 | | | I. Tr. In. | | | | |
| | 22 | 38 | | III. Sh. In. | 21 | 5 | 38 | 41.8 | I. Ec. Dis. | | 12 | 42 | | | I. Sh. Eg. | | | | |
| 15 | 0 | 46 | | III. Tr. In. | | 8 | 34 | | I. Oc. Re. | | 13 | 25 | | | I. Tr. Eg. | | | | |
| | 1 | 2 | | I. Sh. In. | | 12 | 16 | | II. Sh. In. | | 18 | 33 | 28.2 | | IV. Ec. Dis. | | | | |
| | 1 | 33 | | I. Tr. In. | | 13 | 33 | | II. Tr. In. | | 23 | 8 | 36.8 | | IV. Ec. Re. | | | | |
| | 2 | 18 | | III. Sh. Eg. | | 15 | 12 | | II. Sh. Eg. | 28 | 1 | 23 | | | IV. Oc. Dis. | | | | |
| | 3 | 22 | | I. Sh. Eg. | | 16 | 29 | | II. Tr. Eg. | | 6 | 9 | | | IV. Oc. Re. | | | | |
| | 3 | 53 | | I. Tr. Eg. | 22 | 2 | 38 | | III. Sh. In. | | 7 | 32 | 47.4 | | I. Ec. Dis. | | | | |
| | 4 | 26 | | III. Tr. Eg. | | 2 | 57 | | I. Sh. In. | | 10 | 34 | | | I. Oc. Re. | | | | |
| | 22 | 13 | 8.9 | I. Ec. Dis. | | 3 | 34 | | I. Tr. In. | | 14 | 50 | | | II. Sh. In. | | | | |
| 16 | 1 | 3 | | I. Oc. Re. | | 5 | 15 | | III. Tr. In. | | 16 | 21 | | | II. Tr. In. | | | | |
| | 4 | 46 | 13.4 | II. Ec. Dis. | | 5 | 17 | | I. Sh. Eg. | | 17 | 46 | | | II. Sh. Eg. | | | | |
| | 8 | 47 | | II. Oc. Re. | | 5 | 54 | | I. Tr. Eg. | | 19 | 17 | | | II. Tr. Eg. | | | | |
| | 19 | 30 | | I. Sh. In. | | 6 | 18 | | III. Sh. Eg. | 29 | 4 | 51 | | | I. Sh. In. | | | | |
| | 20 | 4 | | I. Tr. In. | | 8 | 54 | | III. Tr. Eg. | | 5 | 36 | | | I. Tr. In. | | | | |
| | 21 | 50 | | I. Sh. Eg. | 23 | 0 | 7 | 16.2 | I. Ec. Dis. | | 6 | 38 | | | III. Sh. In. | | | | |
| | 22 | 24 | | I. Tr. Eg. | | 3 | 4 | | I. Oc. Re. | | 7 | 11 | | | I. Sh. Eg. | | | | |
| 17 | 16 | 41 | 39.4 | I. Ec. Dis. | | 7 | 23 | 0.6 | II. Ec. Dis. | | 7 | 56 | | | I. Tr. Eg. | | | | |
| | 19 | 33 | | I. Oc. Re. | | 11 | 38 | | II. Oc. Re. | | 9 | 43 | | | III. Tr. In. | | | | |
| | 22 | 58 | | II. Sh. In. | | 21 | 26 | | I. Sh. In. | | 10 | 18 | | | III. Sh. Eg. | | | | |
| 18 | 0 | 8 | | II. Tr. In. | | 22 | 5 | | I. Tr. In. | | 13 | 22 | | | III. Tr. Eg. | | | | |
| | 1 | 54 | | II. Sh. Eg. | | 23 | 46 | | I. Sh. Eg. | 30 | 2 | 1 | 21.3 | | I. Ec. Dis. | | | | |
| | 3 | 4 | | II. Tr. Eg. | | 0 | 25 | | I. Tr. Eg. | | 5 | 5 | | | I. Oc. Re. | | | | |
| | 12 | 36 | 27.5 | III. Ec. Dis. | | 18 | 35 | 46.1 | I. Ec. Dis. | | 9 | 59 | 35.9 | | II. Ec. Dis. | | | | |
| | 13 | 59 | | I. Sh. In. | | 21 | 34 | | I. Oc. Re. | | 14 | 27 | | | II. Oc. Re. | | | | |
| | 14 | 34 | | I. Tr. In. | 25 | 1 | 33 | | II. Sh. In. | | 23 | 19 | | | I. Sh. In. | | | | |
| | 16 | 19 | | I. Sh. Eg. | | 2 | 57 | | II. Tr. In. | 31 | 0 | 6 | | | I. Tr. In. | | | | |
| | 16 | 54 | | I. Tr. Eg. | | 4 | 29 | | II. Sh. Eg. | | 1 | 39 | | | I. Sh. Eg. | | | | |
| | 18 | 34 | | III. Oc. Re. | | 5 | 53 | | II. Tr. Eg. | | 2 | 26 | | | I. Tr. Eg. | | | | |
| 19 | 10 | 43 | | IV. Sh. In. | | 15 | 54 | | I. Sh. In. | | 20 | 29 | 50.3 | | I. Ec. Dis. | | | | |
| | 11 | 10 | 10.8 | I. Ec. Dis. | | 16 | 35 | | I. Tr. In. | | 23 | 35 | | | I. Oc. Re. | | | | |

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

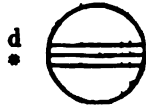
I.



III.



II.



IV.

*Configurations at 17^h 30^m for an Inverting Telescope.*

| Day. | West. | | | East. | | |
|------|------------------|--|------------------|-------------------------------|----------------|------------------|
| 13 | | 1 [•] | ○ | 2 [•] | 3 [•] | 4 [•] |
| 14 | | 2 [•] | ○ | 3 [•] 1 [•] | | 4 [•] |
| 15 | | 3 [•] 2 [•] 1 [•] | ○ | | | 4 [•] |
| 16 | | 3 [•] | ○ | 1 [•] 2 [•] | | 4 [•] |
| 17 | | 3 [•] | ○ | 2 [•] | 4 [•] | 1 [•] ● |
| 18 | | 2 [•] 1 [•] | ○ | 4 [•] | | 3 [•] ● |
| 19 | ○ 4 [•] | | 2 [•] ○ | 1 [•] 3 [•] | | |
| 20 | | 4 [•] 1 [•] | ○ | 2 [•] 3 [•] | | |
| 21 | | 4 [•] | 2 [•] ○ | 1 [•] 3 [•] | | |
| 22 | 4 [•] | 2 [•] 3 [•] 1 [•] | ○ | | | |
| 23 | 4 [•] | 3 [•] | ○ | 1 [•] 2 [•] | | |
| 24 | 4 [•] | 3 [•] 1 [•] | ○ | 2 [•] | | |
| 25 | ○ 1 [•] | 4 [•] 2 [•] 3 [•] | ○ | | | |
| 26 | | 4 [•] 2 [•] | ○ | 1 [•] 3 [•] | | |
| 27 | | 1 [•] 4 [•] | ○ | 2 [•] 3 [•] | | |
| 28 | ○ 2 [•] | | ○ | 1 [•] 3 [•] | | |
| 29 | | 2 [•] 1 [•] 3 [•] | ○ | 4 [•] | | |
| 30 | | 3 [•] | ○ | 2 [•] 1 [•] | | 4 [•] |
| 31 | | 3 [•] 1 [•] | ○ | 2 [•] | | 4 [•] |

WASHINGTON MEAN TIME.

APRIL.

| d | h | m | s | | d | h | m | s | | d | h | m | s | | d | h | m | s | |
|----|----|----|------|---------------|----|----|----|------|----------------|----|----|------|------|--|----|----|------|------|----------------|
| 1 | 4 | 8 | | | 11 | 20 | 1 | | | 21 | 23 | 8 | | | 21 | 23 | 8 | | |
| | 5 | 45 | | II. Sh. In. | | 21 | 57 | | II. Tr. In. | 22 | 11 | 52.1 | | | 22 | 11 | 52.1 | | IV. Sh. In. |
| | 7 | 4 | | II. Sh. Eg. | | 22 | 57 | | II. Sh. Eg. | | 3 | 53 | | | | 3 | 53 | | IV. Sh. Eg. |
| | 8 | 41 | | II. Tr. Eg. | 12 | 0 | 53 | | II. Tr. Eg. | | 5 | 34 | | | | 5 | 34 | | I. Oc. Re. |
| | 17 | 48 | | I. Sh. In. | | 8 | 39 | | I. Sh. In. | | 9 | 21 | | | | 9 | 21 | | IV. Tr. In. |
| | 18 | 36 | | I. Tr. In. | | 9 | 36 | | I. Tr. In. | | 11 | 55 | | | | 11 | 55 | | II. Sh. In. |
| | 20 | 8 | | I. Sh. Eg. | | 10 | 59 | | I. Sh. Eg. | | 13 | 55 | | | | 13 | 55 | | IV. Tr. Eg. |
| | 20 | 37 | 12.3 | III. Ec. Dis. | | 11 | 56 | | I. Tr. Eg. | | 14 | 6 | | | | 14 | 6 | | II. Tr. In. |
| | 20 | 56 | | I. Tr. Eg. | | 14 | 39 | | III. Sh. In. | | 14 | 51 | | | | 14 | 51 | | II. Sh. Eg. |
| 2 | 3 | 28 | | III. Oc. Re. | | 18 | 18 | | III. Sh. Eg. | | 17 | 1 | | | | 17 | 1 | | II. Tr. Eg. |
| | 14 | 58 | 22.0 | I. Ec. Dis. | | 18 | 35 | | III. Tr. In. | | 23 | 30 | | | | 23 | 30 | | I. Sh. In. |
| | 18 | 5 | | I. Oc. Re. | | 22 | 11 | | III. Tr. Eg. | 23 | 0 | 37 | | | | 0 | 37 | | I. Tr. In. |
| | 23 | 17 | 30.5 | II. Ec. Dis. | 13 | 5 | 49 | 24.9 | I. Ec. Dis. | | 1 | 50 | | | | 1 | 50 | | I. Sh. Eg. |
| 3 | 3 | 52 | | II. Oc. Re. | | 9 | 5 | | I. Oc. Re. | | 2 | 56 | | | | 2 | 56 | | I. Tr. Eg. |
| | 12 | 16 | | I. Sh. In. | | 12 | 44 | 32.3 | IV. Ec. Dis. | | 8 | 38 | 59.4 | | | 8 | 38 | 59.4 | III. Ec. Dis. |
| | 13 | 6 | | I. Tr. In. | | 15 | 12 | 10.8 | II. * Ec. Dis. | | 12 | 7 | 36.2 | | | 12 | 7 | 36.2 | III. Ec. Re. |
| | 14 | 36 | | I. Sh. Eg. | | 17 | 17 | 1.5 | IV. Ec. Re. | | 13 | 3 | | | | 13 | 3 | | III. Oc. Dis. |
| | 15 | 26 | | I. * Tr. Eg. | | 20 | 4 | | II. Oc. Re. | | 16 | 38 | | | | 16 | 38 | | III. * Oc. Re. |
| 4 | 9 | 26 | 50.5 | I. Ec. Dis. | | 21 | 53 | | IV. Oc. Dis. | | 20 | 40 | 22.8 | | | 20 | 40 | 22.8 | I. Ec. Dis. |
| | 12 | 35 | | I. Oc. Re. | 14 | 2 | 31 | | IV. Oc. Re. | | 24 | 0 | 4 | | | 24 | 0 | 4 | I. Oc. Re. |
| | 17 | 26 | | II. Sh. In. | | 3 | 8 | | I. Sh. In. | | 7 | 5 | 53.0 | | | 7 | 5 | 53.0 | II. Ec. Dis. |
| | 19 | 9 | | II. Tr. In. | | 4 | 6 | | I. Tr. In. | | 12 | 13 | | | | 12 | 13 | | II. Oc. Re. |
| | 20 | 22 | | II. Sh. Eg. | | 5 | 28 | | I. Sh. Eg. | | 17 | 59 | | | | 17 | 59 | | I. Sh. In. |
| | 22 | 5 | | II. Tr. Eg. | | 6 | 26 | | I. Tr. Eg. | | 19 | 7 | | | | 19 | 7 | | I. Tr. In. |
| 5 | 4 | 56 | | IV. Sh. In. | 15 | 0 | 17 | 53.1 | I. Ec. Dis. | | 20 | 19 | | | | 20 | 19 | | I. Sh. Eg. |
| | 6 | 45 | | I. Sh. In. | | 3 | 35 | | I. Oc. Re. | | 21 | 26 | | | | 21 | 26 | | I. Tr. Eg. |
| | 7 | 36 | | I. Tr. In. | | 9 | 19 | | II. Sh. In. | 25 | 15 | 8 | 49.8 | | | 15 | 8 | 49.8 | I. * Ec. Dis. |
| | 9 | 5 | | I. Sh. Eg. | | 11 | 20 | | II. Tr. In. | | 18 | 33 | | | | 18 | 33 | | I. Oc. Re. |
| | 9 | 43 | | IV. Sh. Eg. | | 12 | 15 | | II. Sh. Eg. | 26 | 1 | 13 | | | | 1 | 13 | | II. Sh. In. |
| | 9 | 56 | | I. Tr. Eg. | | 14 | 16 | | II. Tr. Eg. | | 3 | 29 | | | | 3 | 29 | | II. Tr. In. |
| | 10 | 38 | | III. Sh. In. | | 21 | 36 | | I. Sh. In. | | 4 | 9 | | | | 4 | 9 | | II. Sh. Eg. |
| | 13 | 1 | | IV. Tr. In. | | 22 | 37 | | I. Tr. In. | | 6 | 24 | | | | 6 | 24 | | II. Tr. Eg. |
| | 14 | 9 | | III. Tr. In. | | 23 | 56 | | I. Sh. Eg. | | 12 | 27 | | | | 12 | 27 | | I. Sh. In. |
| | 14 | 18 | | III. Sh. Eg. | 16 | 0 | 56 | | I. Tr. Eg. | | 13 | 36 | | | | 13 | 36 | | I. Tr. In. |
| | 17 | 44 | | IV. Tr. Eg. | | 4 | 38 | 33.4 | III. Ec. Dis. | | 14 | 47 | | | | 14 | 47 | | I. Sh. Eg. |
| | 17 | 47 | | III. Tr. Eg. | | 8 | 7 | 35.0 | III. Ec. Re. | | 15 | 55 | | | | 15 | 55 | | I. * Tr. Eg. |
| 6 | 3 | 55 | 24.1 | I. Ec. Dis. | | 8 | 41 | | III. Oc. Dis. | | 22 | 40 | | | | 22 | 40 | | III. Sh. In. |
| | 7 | 5 | | I. Oc. Re. | | 12 | 17 | | III. Oc. Re. | 27 | 2 | 20 | | | | 2 | 20 | | III. Sh. Eg. |
| | 12 | 35 | 59.4 | II. Ec. Dis. | | 18 | 46 | 24.1 | I. Ec. Dis. | | 3 | 20 | | | | 3 | 20 | | III. Tr. In. |
| | 17 | 16 | | II. Oc. Re. | | 22 | 5 | | I. Oc. Re. | | 6 | 54 | | | | 6 | 54 | | III. Tr. Eg. |
| 7 | 1 | 14 | | I. Sh. In. | 17 | 4 | 29 | 57.3 | II. Ec. Dis. | | 9 | 37 | 22.4 | | | 9 | 37 | 22.4 | I. Ec. Dis. |
| | 2 | 6 | | I. Tr. In. | | 9 | 27 | | II. Oc. Re. | | 13 | 3 | | | | 13 | 3 | | I. Oc. Re. |
| | 3 | 34 | | I. Sh. Eg. | | 16 | 5 | | I. * Sh. In. | | 20 | 23 | 57.3 | | | 20 | 23 | 57.3 | II. Ec. Dis. |
| | 4 | 26 | | I. Tr. Eg. | | 17 | 7 | | I. Tr. In. | 28 | 1 | 35 | | | | 1 | 35 | | II. Oc. Re. |
| | 22 | 23 | 52.8 | I. Ec. Dis. | | 18 | 25 | | I. Sh. Eg. | | 6 | 56 | | | | 6 | 56 | | I. Sh. In. |
| 8 | 1 | 35 | | I. Oc. Re. | | 19 | 26 | | I. Tr. Eg. | | 8 | 5 | | | | 8 | 5 | | I. Tr. In. |
| | 6 | 44 | | II. Sh. In. | 18 | 13 | 14 | 51.2 | I. Ec. Dis. | | 9 | 16 | | | | 9 | 16 | | I. Sh. Eg. |
| | 8 | 33 | | II. Tr. In. | | 16 | 34 | | I. * Oc. Re. | | 10 | 24 | | | | 10 | 24 | | I. Tr. Eg. |
| | 9 | 40 | | II. Sh. Eg. | | 22 | 37 | | II. Sh. In. | 29 | 4 | 5 | 49.8 | | | 4 | 5 | 49.8 | I. Ec. Dis. |
| | 11 | 29 | | II. Tr. Eg. | 19 | 0 | 43 | | II. Tr. In. | | 7 | 33 | | | | 7 | 33 | | I. Oc. Re. |
| | 19 | 42 | | I. Sh. In. | | 1 | 33 | | II. Sh. Eg. | | 14 | 31 | | | | 14 | 31 | | II. Sh. In. |
| | 20 | 36 | | I. Tr. In. | | 3 | 38 | | II. Tr. Eg. | | 16 | 52 | | | | 16 | 52 | | II. * Tr. In. |
| | 22 | 2 | | I. Sh. Eg. | | 10 | 33 | | I. Sh. In. | | 17 | 27 | | | | 17 | 27 | | II. Sh. Eg. |
| | 22 | 56 | | I. Tr. Eg. | | 11 | 37 | | I. Tr. In. | | 19 | 47 | | | | 19 | 47 | | II. Tr. Eg. |
| 9 | 0 | 38 | 10.6 | III. Ec. Dis. | | 12 | 53 | | I. Sh. Eg. | 30 | 1 | 24 | | | | 1 | 24 | | I. Sh. In. |
| | 4 | 7 | 36.8 | III. Ec. Re. | | 13 | 56 | | I. Tr. Eg. | | 2 | 34 | | | | 2 | 34 | | I. Tr. In. |
| | 4 | 17 | | III. Oc. Dis. | | 18 | 39 | | III. Sh. In. | | 3 | 44 | | | | 3 | 44 | | I. Sh. Eg. |
| | 7 | 54 | | III. Oc. Re. | | 22 | 19 | | III. Sh. Eg. | | 4 | 53 | | | | 4 | 53 | | I. Tr. Eg. |
| | 16 | 52 | 23.9 | I. * Ec. Dis. | | 22 | 58 | | III. Tr. In. | | 6 | 55 | 49.1 | | | 6 | 55 | 49.1 | IV. Ec. Dis. |
| | 20 | 5 | | I. Oc. Re. | 20 | 2 | 33 | | III. Tr. Eg. | | 11 | 25 | 6.9 | | | 11 | 25 | 6.9 | IV. Ec. Re. |
| 10 | 1 | 53 | 50.1 | II. Ec. Dis. | | 7 | 43 | 24.1 | I. Ec. Dis. | | 12 | 38 | 59.3 | | | 12 | 38 | 59.3 | III. Ec. Dis. |
| | 6 | 40 | | II. Oc. Re. | | 11 | 4 | | I. Oc. Re. | | 16 | 7 | 9.1 | | | 16 | 7 | 9.1 | III. * Ec. Re. |
| | 14 | 11 | | I. Sh. In. | | 17 | 48 | 9.9 | II. Ec. Dis. | | 17 | 23 | | | | 17 | 23 | | III. Oc. Dis. |
| | 15 | 6 | | I. * Tr. In. | | 22 | 50 | | II. Oc. Re. | | 17 | 59 | | | | 17 | 59 | | IV. Oc. Dis. |
| | 16 | 31 | | I. * Sh. Eg. | 21 | 5 | 2 | | I. Sh. In. | | 20 | 56 | | | | 20 | 56 | | III. Oc. Re. |
| | 17 | 26 | | I. Tr. Eg. | | 6 | 7 | | I. Tr. In. | | 22 | 27 | | | | 22 | 27 | | IV. Oc. Re. |
| 11 | 11 | 20 | 51.8 | I. Ec. Dis. | | 7 | 22 | | I. Sh. Eg. | | 22 | 34 | 20.6 | | | 22 | 34 | 20.6 | I. Ec. Dis. |
| | 14 | 35 | | I. Oc. Re. | | 8 | 26 | | I. Tr. Eg. | | | | | | | | | | |

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

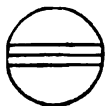
APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.

d

•



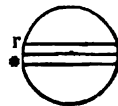
III.

d

•

r

•



II.

d

•



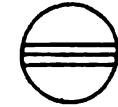
IV.

d

•

r

•

*Configurations at 16^h 30^m for an Inverting Telescope.*

| Day. | West. | | | | East. | | | |
|------|-------|-------------------------------|--|-------------------------------|-------|---|--|---------------------------------|
| 1 | | | 2 [•] | 3 [•] | ○ | 1 [•] | | 4 [•] |
| 2 | | | | 2 [•] | ○ | | 3 [•] | 4 [•] 1 [•] ● |
| 3 | | | | 1 [•] | ○ | | 2 [•] 3 [•] 4 [•] | |
| 4 | | | | | ○ | 2 [•] 1 [•] 4 [•] 3 [•] | | |
| 5 | | | 2 [•] 1 [•] | 3 [•] | ○ | | | |
| 6 | | | 3 [•] 4 [•] | | ○ | 1 [•] | | 2 [•] ● |
| 7 | | 4 [•] 3 [•] | | 1 [•] | ○ | | 2 [•] | |
| 8 | | 4 [•] | | 3 [•] 2 [•] | ○ | 1 [•] | | |
| 9 | | 4 [•] | | 2 [•] 1 [•] | ○ | | 3 [•] | |
| 10 | ○ | 1 [•] 4 [•] | | | ○ | | 2 [•] 3 [•] | |
| 11 | | | 4 [•] | | ○ | 1 [•] 2 [•] | 3 [•] | |
| 12 | | | 4 [•] 2 [•] 1 [•] | | ○ | 3 [•] | | |
| 13 | | | 3 [•] | 4 [•] | ○ | | 1 [•] | |
| 14 | | | 3 [•] | 1 [•] | ○ | | 2 [•] 4 [•] | |
| 15 | | | | 3 [•] 2 [•] | ○ | 1 [•] | | 4 [•] |
| 16 | | | | 2 [•] 1 [•] | ○ | | 3 [•] | 4 [•] |
| 17 | | | | | ○ | 1 [•] 2 [•] | 3 [•] | 4 [•] |
| 18 | | | | | ○ | 2 [•] 3 [•] | | 4 [•] 1 [•] ● |
| 19 | | | 2 [•] 1 [•] | | ○ | 3 [•] | | 4 [•] |
| 20 | | | 3 [•] 2 [•] | | ○ | 1 [•] | | 4 [•] |
| 21 | | | 3 [•] | 1 [•] | ○ | | 4 [•] 2 [•] | |
| 22 | ○ | 2 [•] | | 3 [•] 4 [•] | ○ | 1 [•] | | |
| 23 | | | 4 [•] 2 [•] 1 [•] | | ○ | | | 3 [•] ● |
| 24 | | 4 [•] | | | ○ | 1 [•] 2 [•] | 3 [•] | |
| 25 | | 4 [•] | | | ○ | | 2 [•] 3 [•] | 1 [•] ● |
| 26 | | 4 [•] | | 2 [•] 1 [•] | ○ | | 3 [•] | |
| 27 | | 4 [•] | | 3 [•] 2 [•] | ○ | 1 [•] | | |
| 28 | | 4 [•] 3 [•] | | 1 [•] | ○ | | 2 [•] | |
| 29 | | | 3 [•] 4 [•] | | ○ | 2 [•] 1 [•] | | |
| 30 | | | 2 [•] 1 [•] | 4 [•] | ○ | | | |

WASHINGTON MEAN TIME.

MAY.

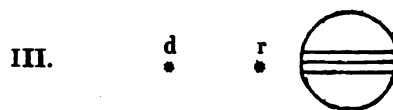
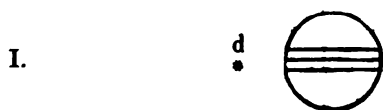
| d | h | m | s | | d | h | m | s | | d | h | m | s | | d | h | m | s | |
|----|----|----|------|---------------|----|----|----|------|----------------|----|----|----|------|----------------|----|----|----|------|----------------|
| 1 | 2 | 2 | | I. Oc. Re. | 11 | 13 | 25 | 17.1 | I. * Ec. Dis. | 22 | 4 | 6 | 16.2 | III. Ec. Re. | 29 | 4 | 6 | 16.2 | III. Ec. Re. |
| | 9 | 41 | 36.9 | II. Ec. Dis. | | 15 | 24 | | III. * Tr. Eg. | | 4 | 16 | 13.3 | I. Ec. Dis. | | 4 | 16 | 13.3 | I. Ec. Dis. |
| | 14 | 57 | | II. * Oc. Re. | | 16 | 59 | | I. Oc. Re. | | 6 | 5 | | III. Oc. Dis. | | 6 | 5 | | III. Oc. Dis. |
| | 19 | 53 | | I. Sh. In. | 12 | 1 | 34 | 59.2 | II. Ec. Dis. | | 7 | 54 | | I. Oc. Re. | | 7 | 54 | | I. Oc. Re. |
| | 21 | 4 | | I. Tr. In. | | 7 | 1 | | II. Oc. Re. | | 9 | 33 | | III. Oc. Re. | | 9 | 33 | | III. Oc. Re. |
| | 22 | 13 | | I. Sh. Eg. | | 10 | 44 | | I. Sh. In. | | 17 | 27 | 43.6 | II. Ec. Dis. | | 17 | 27 | 43.6 | II. Ec. Dis. |
| | 23 | 23 | | I. Tr. Eg. | | 12 | 1 | | I. Tr. In. | | 23 | 0 | | II. Oc. Re. | | 23 | 0 | | II. Oc. Re. |
| 2 | 17 | 2 | 47.3 | I. Ec. Dis. | | 13 | 4 | | I. Sh. Eg. | 23 | 1 | 34 | | I. Sh. In. | | 1 | 34 | | I. Sh. In. |
| | 20 | 32 | | I. Oc. Re. | | 14 | 20 | | I. * Tr. Eg. | | 2 | 55 | | I. Tr. In. | | 2 | 55 | | I. Tr. In. |
| 3 | 3 | 49 | | II. Sh. In. | 13 | 7 | 53 | 44.7 | I. Ec. Dis. | | 3 | 54 | | I. Sh. Eg. | | 3 | 54 | | I. Sh. Eg. |
| | 6 | 14 | | II. Tr. In. | | 11 | 28 | | I. Oc. Re. | | 5 | 14 | | I. Tr. Eg. | | 5 | 14 | | I. Tr. Eg. |
| | 6 | 45 | | II. Sh. Eg. | | 19 | 42 | | II. Sh. In. | | 22 | 44 | 39.5 | I. Ec. Dis. | | 22 | 44 | 39.5 | I. Ec. Dis. |
| | 9 | 9 | | II. Tr. Eg. | | 22 | 18 | | II. Tr. In. | 24 | 2 | 23 | | I. Oc. Re. | | 2 | 23 | | I. Oc. Re. |
| | 14 | 21 | | I. * Sh. In. | | 22 | 38 | | II. Sh. Eg. | | 11 | 37 | | II. Sh. In. | | 11 | 37 | | II. Sh. In. |
| | 15 | 34 | | I. * Tr. In. | 14 | 1 | 12 | | II. Tr. Eg. | | 14 | 19 | | II. * Tr. In. | | 14 | 19 | | II. * Tr. In. |
| | 16 | 41 | | I. Sh. Eg. | | 5 | 12 | | I. Sh. In. | | 14 | 32 | | II. * Sh. Eg. | | 14 | 32 | | II. * Sh. Eg. |
| | 17 | 53 | | I. Tr. Eg. | | 6 | 30 | | I. Tr. In. | | 17 | 13 | | II. Tr. Eg. | | 17 | 13 | | II. Tr. Eg. |
| 4 | 2 | 41 | | III. Sh. In. | | 7 | 32 | | I. Sh. Eg. | | 20 | 3 | | I. Sh. In. | | 20 | 3 | | I. Sh. In. |
| | 6 | 19 | | III. Sh. Eg. | | 8 | 49 | | I. Tr. Eg. | | 21 | 24 | | I. Tr. In. | | 21 | 24 | | I. Tr. In. |
| | 7 | 39 | | III. Tr. In. | | 20 | 39 | 15.1 | III. Ec. Dis. | | 22 | 23 | | I. Sh. Eg. | | 22 | 23 | | I. Sh. Eg. |
| | 11 | 11 | | III. Tr. Eg. | 15 | 0 | 6 | 27.5 | III. Ec. Re. | | 23 | 43 | | I. Tr. Eg. | | 23 | 43 | | I. Tr. Eg. |
| | 11 | 31 | 19.9 | I. Ec. Dis. | | 1 | 54 | | III. Oc. Dis. | 25 | 11 | 35 | | IV. Sh. In. | | 11 | 35 | | IV. Sh. In. |
| | 15 | 2 | | I. * Oc. Re. | | 2 | 22 | 15.4 | I. Ec. Dis. | | 14 | 41 | | III. * Sh. In. | | 14 | 41 | | III. * Sh. In. |
| | 22 | 59 | 33.7 | II. Ec. Dis. | | 5 | 24 | | III. Oc. Re. | | 16 | 13 | | IV. * Sh. Eg. | | 16 | 13 | | IV. * Sh. Eg. |
| 5 | 4 | 19 | | II. Oc. Re. | | 5 | 57 | | I. Oc. Re. | | 17 | 13 | 12.6 | I. Ec. Dis. | | 17 | 13 | 12.6 | I. Ec. Dis. |
| | 8 | 50 | | I. Sh. In. | | 14 | 52 | 31.7 | II. * Ec. Dis. | | 18 | 18 | | III. Sh. Eg. | | 18 | 18 | | III. Sh. Eg. |
| | 10 | 4 | | I. Tr. In. | | 20 | 21 | | II. Oc. Re. | | 20 | 15 | | III. Tr. In. | | 20 | 15 | | III. Tr. In. |
| | 11 | 10 | | I. Sh. Eg. | | 23 | 41 | | I. Sh. In. | | 20 | 52 | | I. Oc. Re. | | 20 | 52 | | I. Oc. Re. |
| | 12 | 23 | | I. Tr. Eg. | 16 | 0 | 59 | | I. Tr. In. | | 23 | 43 | | III. Tr. Eg. | | 23 | 43 | | III. Tr. Eg. |
| 6 | 5 | 59 | 47.2 | I. Ec. Dis. | | 2 | 1 | | I. Sh. Eg. | 26 | 0 | 27 | | IV. Tr. In. | | 0 | 27 | | IV. Tr. In. |
| | 9 | 31 | | I. Oc. Re. | | 3 | 18 | | I. Tr. Eg. | | 4 | 38 | | IV. Tr. Eg. | | 4 | 38 | | IV. Tr. Eg. |
| | 17 | 7 | | II. Sh. In. | | 20 | 50 | 41.4 | I. Ec. Dis. | | 6 | 45 | 20.0 | II. Ec. Dis. | | 6 | 45 | 20.0 | II. Ec. Dis. |
| | 19 | 36 | | II. Tr. In. | 17 | 0 | 27 | | I. Oc. Re. | | 12 | 19 | | II. Oc. Re. | | 12 | 19 | | II. Oc. Re. |
| | 20 | 3 | | II. Sh. Eg. | | 1 | 7 | 21.9 | IV. Ec. Dis. | | 14 | 31 | | I. * Sh. In. | | 14 | 31 | | I. * Sh. In. |
| | 22 | 31 | | II. Tr. Eg. | | 5 | 33 | 4.3 | IV. Ec. Re. | | 15 | 53 | | I. * Tr. In. | | 15 | 53 | | I. * Tr. In. |
| 7 | 3 | 18 | | I. Sh. In. | | 9 | 0 | | II. Sh. In. | | 16 | 51 | | I. Sh. Eg. | | 16 | 51 | | I. Sh. Eg. |
| | 4 | 33 | | I. Tr. In. | | 11 | 39 | | II. Tr. In. | | 18 | 12 | | I. Tr. Eg. | | 18 | 12 | | I. Tr. Eg. |
| | 5 | 38 | | I. Sh. Eg. | | 11 | 56 | | II. Sh. Eg. | 27 | 11 | 41 | 40.2 | I. Ec. Dis. | | 11 | 41 | 40.2 | I. Ec. Dis. |
| | 6 | 52 | | I. Tr. Eg. | | 13 | 32 | | IV. * Oc. Dis. | | 15 | 21 | | I. Oc. Re. | | 15 | 21 | | I. Oc. Re. |
| | 16 | 38 | 57.1 | III. Ec. Dis. | | 14 | 33 | | II. * Tr. Eg. | 28 | 0 | 55 | | II. Sh. In. | | 0 | 55 | | II. Sh. In. |
| | 20 | 6 | 38.7 | III. Ec. Re. | | 17 | 49 | | IV. Oc. Re. | | 3 | 39 | | II. Tr. In. | | 3 | 39 | | II. Tr. In. |
| | 21 | 39 | | III. Oc. Dis. | | 18 | 9 | | I. Sh. In. | | 3 | 50 | | II. Sh. Eg. | | 3 | 50 | | II. Sh. Eg. |
| 8 | 0 | 28 | 18.2 | I. Ec. Dis. | | 19 | 28 | | I. Tr. In. | | 6 | 32 | | II. Tr. Eg. | | 6 | 32 | | II. Tr. Eg. |
| | 1 | 11 | | III. Oc. Re. | | 20 | 29 | | I. Sh. Eg. | | 9 | 0 | | I. Sh. In. | | 9 | 0 | | I. Sh. In. |
| | 4 | 0 | | I. Oc. Re. | | 21 | 47 | | I. Tr. Eg. | | 10 | 22 | | I. Tr. In. | | 10 | 22 | | I. Tr. In. |
| | 12 | 17 | 9.8 | II. Ec. Dis. | 18 | 10 | 41 | | III. Sh. In. | | 11 | 20 | | I. Sh. Eg. | | 11 | 20 | | I. Sh. Eg. |
| | 17 | 21 | | IV. Sh. In. | | 14 | 18 | | III. * Sh. Eg. | | 12 | 41 | | I. Tr. Eg. | | 12 | 41 | | I. Tr. Eg. |
| | 17 | 40 | | II. Oc. Re. | | 15 | 19 | 14.4 | I. * Ec. Dis. | 29 | 4 | 40 | 32.3 | III. Ec. Dis. | | 4 | 40 | 32.3 | III. Ec. Dis. |
| | 21 | 47 | | I. Sh. In. | | 16 | 6 | | III. * Tr. In. | | 6 | 10 | 12.2 | I. Ec. Dis. | | 6 | 10 | 12.2 | I. Ec. Dis. |
| | 22 | 3 | | IV. Sh. Eg. | | 18 | 56 | | I. Oc. Re. | | 8 | 6 | 41.7 | III. Ec. Re. | | 8 | 6 | 41.7 | III. Ec. Re. |
| | 23 | 2 | | I. Tr. In. | | 19 | 35 | | III. Tr. Eg. | | 9 | 49 | | I. Oc. Re. | | 9 | 49 | | I. Oc. Re. |
| 9 | 0 | 7 | | I. Sh. Eg. | 19 | 4 | 10 | 14.3 | II. Ec. Dis. | | 10 | 13 | | III. Oc. Dis. | | 10 | 13 | | III. Oc. Dis. |
| | 1 | 21 | | I. Tr. Eg. | | 9 | 41 | | II. Oc. Re. | | 13 | 40 | | III. * Oc. Re. | | 13 | 40 | | III. * Oc. Re. |
| | 5 | 12 | | IV. Tr. In. | | 12 | 37 | | I. Sh. In. | | 20 | 2 | 46.5 | II. Ec. Dis. | | 20 | 2 | 46.5 | II. Ec. Dis. |
| | 9 | 35 | | IV. Tr. Eg. | | 13 | 57 | | I. * Tr. In. | 30 | 1 | 38 | | II. Oc. Re. | | 1 | 38 | | II. Oc. Re. |
| | 18 | 56 | 44.4 | I. Ec. Dis. | | 14 | 57 | | I. * Sh. Eg. | | 3 | 28 | | I. Sh. In. | | 3 | 28 | | I. Sh. In. |
| | 22 | 30 | | I. Oc. Re. | | 16 | 16 | | I. * Tr. Eg. | | 4 | 51 | | I. Tr. In. | | 4 | 51 | | I. Tr. In. |
| 10 | 6 | 24 | | II. Sh. In. | 20 | 9 | 47 | 41.8 | I. Ec. Dis. | | 5 | 48 | | I. Sh. Eg. | | 5 | 48 | | I. Sh. Eg. |
| | 8 | 57 | | II. Tr. In. | | 13 | 25 | | I. Oc. Re. | | 7 | 10 | | I. Tr. Eg. | | 7 | 10 | | I. Tr. Eg. |
| | 9 | 20 | | II. Sh. Eg. | | 22 | 19 | | II. Sh. In. | 31 | 0 | 38 | 38.5 | I. Ec. Dis. | | 0 | 38 | 38.5 | I. Ec. Dis. |
| | 11 | 51 | | II. Tr. Eg. | 21 | 0 | 59 | | II. Tr. In. | | 4 | 18 | | I. Oc. Re. | | 4 | 18 | | I. Oc. Re. |
| | 16 | 15 | | I. * Sh. In. | | 1 | 15 | | II. Sh. Eg. | | 14 | 13 | | II. * Sh. In. | | 14 | 13 | | II. * Sh. In. |
| | 17 | 31 | | I. Tr. In. | | 3 | 53 | | II. Tr. Eg. | | 16 | 58 | | II. Tr. In. | | 16 | 58 | | II. Tr. In. |
| | 18 | 35 | | I. Sh. Eg. | | 7 | 6 | | I. Sh. In. | | 17 | 8 | | II. Sh. Eg. | | 17 | 8 | | II. Sh. Eg. |
| | 19 | 50 | | I. Tr. Eg. | | 8 | 28 | | I. Tr. In. | | 19 | 51 | | II. Tr. Eg. | | 19 | 51 | | II. Tr. Eg. |
| 11 | 6 | 40 | | III. Sh. In. | | 9 | 26 | | I. Sh. Eg. | | 21 | 57 | | I. Sh. In. | | 21 | 57 | | I. Sh. In. |
| | 10 | 18 | | III. Sh. Eg. | | 10 | 45 | | I. Tr. Eg. | | 23 | 19 | | I. Tr. In. | | 23 | 19 | | I. Tr. In. |
| | 11 | 54 | | III. Tr. In. | 22 | 0 | 39 | 34.4 | III. Ec. Dis. | | | | | | | | | | |

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.*Configurations at 15^h for an Inverting Telescope.*

| Day. | West. | East. |
|------|---------|-------------|
| 1 | | ○ 2 1' 4 3 |
| 2 | | 1 ○ 2 3 4 |
| 3 | ○ 1 | 2 ○ 3 4 |
| 4 | | 2 3 ○ 4 1 ● |
| 5 | 3 1 | ○ 2 4 |
| 6 | 3 | ○ 2 1 4 |
| 7 | 2 1 3 | ○ 4 |
| 8 | | ○ 1 3 2 ● |
| 9 | 1 4 | ○ 2 3 |
| 10 | 4 2 | ○ 1 3 |
| 11 | ○ 3 4 2 | ○ 1 ● |
| 12 | 4 3 1 | ○ 2 |
| 13 | 4 3 | ○ 1 2 |
| 14 | 4 2 3 1 | ○ |
| 15 | 4 2 | ○ 1 2 |
| 16 | 4 1 | ○ 2 3 |
| 17 | | 2 ○ 1 3 4 ● |
| 18 | 2 1 | ○ 3 4 |
| 19 | ○ 1 3 | ○ 2 4 |
| 20 | 3 | ○ 1 2 4 |
| 21 | 3 1 | ○ 4 |
| 22 | 2 | ○ 3 1 4 |
| 23 | 1 | ○ 2 3 4 |
| 24 | ○ 2 | ○ 1 2 3 4 |
| 25 | 2 1 | ○ 3 4 |
| 26 | 3 4 | ○ 1 2 |
| 27 | 3 4 | ○ 2 1 ● |
| 28 | 4 3 2 1 | ○ |
| 29 | 4 2 | ○ 3 1 |
| 30 | 4 1 | ○ 2 3 |
| 31 | 4 | ○ 2 1 3 |

WASHINGTON MEAN TIME.

JUNE.

| d | h | m | s | | d | h | m | s | | d | h | m | s | | d | h | m | s | |
|----|----|----|------|-----------------|----|----|----|------|-----------------|----|----|----|------|----------------|---|---|---|---|--|
| 1 | 0 | 16 | | I. Sh. Eg. | 11 | 10 | 22 | | IV. Sh. Eg. | 20 | 12 | 49 | | I. * Tr. Eg. | | | | | |
| | 1 | 38 | | I. Tr. Eg. | | 11 | 46 | | II. Tr. Eg. | 21 | 6 | 20 | 45.1 | I. Ec. Dis. | | | | | |
| | 18 | 42 | | III. Sh. In. | | 12 | 47 | | I. * Sh. In. | | 9 | 59 | | I. Oc. Re. | | | | | |
| | 19 | 7 | 11.7 | I. Ec. Dis. | | 14 | 10 | | I. * Tr. In. | | 22 | 3 | | II. Sh. In. | | | | | |
| | 22 | 18 | | III. * Sh. Eg. | | 15 | 6 | | I. * Sh. Eg. | 22 | 0 | 45 | | II. Tr. In. | | | | | |
| | 22 | 47 | | I. Oc. Re. | | 16 | 28 | | I. Tr. Eg. | | 0 | 58 | | II. Sh. Eg. | | | | | |
| 2 | 0 | 21 | | III. Tr. In. | | 18 | 57 | | IV. Tr. In. | | 3 | 37 | | II. Tr. Eg. | | | | | |
| | 3 | 47 | | III. Tr. Eg. | | 22 | 54 | | IV. Tr. Eg. | | 3 | 37 | | I. Sh. In. | | | | | |
| | 9 | 20 | 17.1 | II. Ec. Dis. | 19 | 9 | 58 | 13.4 | I. Ec. Dis. | | 4 | 59 | | I. Tr. In. | | | | | |
| | 14 | 56 | | II. * Oc. Re. | | 12 | 41 | 26.3 | III. * Ec. Dis. | | 5 | 56 | | I. Sh. Eg. | | | | | |
| | 16 | 25 | | I. Sh. In. | | 13 | 38 | | I. * Oc. Re. | | 7 | 17 | | I. Tr. Eg. | | | | | |
| | 17 | 48 | | I. Tr. In. | | 16 | 6 | 26.5 | III. Ec. Re. | 23 | 0 | 49 | 20.6 | I. Ec. Dis. | | | | | |
| | 18 | 44 | | I. Sh. Eg. | | 18 | 17 | | III. Oc. Dis. | | 4 | 27 | | I. Oc. Re. | | | | | |
| | 19 | 18 | 52.2 | IV. Ec. Dis. | | 21 | 41 | | III. Oc. Re. | | 6 | 43 | | III. Sh. In. | | | | | |
| | 20 | 7 | | I. Tr. Eg. | 13 | 1 | 12 | 28.6 | II. Ec. Dis. | | 10 | 17 | | III. Sh. Eg. | | | | | |
| | 23 | 40 | 35.6 | IV. Ec. Re. | | 6 | 47 | | II. Oc. Re. | | 12 | 15 | | III. Tr. In. | | | | | |
| 3 | 8 | 25 | | IV. Oc. Dis. | | 7 | 16 | | I. Sh. In. | | 15 | 36 | | III. * Tr. Eg. | | | | | |
| | 12 | 29 | | IV. Oc. Re. | | 8 | 39 | | I. Tr. In. | | 17 | 4 | 28.6 | II. Ec. Dis. | | | | | |
| | 13 | 35 | 39.6 | I. * Ec. Dis. | | 9 | 35 | | I. Sh. Eg. | | 22 | 6 | | I. Sh. In. | | | | | |
| | 17 | 15 | | I. Oc. Re. | | 10 | 57 | | I. Tr. Eg. | | 22 | 35 | | II. Oc. Re. | | | | | |
| 4 | 3 | 31 | | II. Sh. In. | 14 | 4 | 26 | 40.4 | I. Ec. Dis. | | 23 | 27 | | I. Tr. In. | | | | | |
| | 6 | 17 | | II. Tr. In. | | 8 | 6 | | I. Oc. Re. | 24 | 0 | 26 | | I. Sh. Eg. | | | | | |
| | 6 | 26 | | II. Sh. Eg. | | 19 | 26 | | II. Sh. In. | | 1 | 45 | | I. Tr. Eg. | | | | | |
| | 9 | 10 | | II. Tr. Eg. | | 22 | 11 | | II. Tr. In. | | 19 | 17 | 50.0 | I. Ec. Dis. | | | | | |
| | 10 | 53 | | I. Sh. In. | | 22 | 21 | | II. Sh. Eg. | | 22 | 55 | | I. Oc. Re. | | | | | |
| | 12 | 16 | | I. Tr. In. | 15 | 1 | 4 | | II. Tr. Eg. | 25 | 11 | 21 | | II. Sh. In. | | | | | |
| | 13 | 12 | | I. * Sh. Eg. | | 1 | 44 | | I. Sh. In. | | 14 | 1 | | II. * Tr. In. | | | | | |
| | 14 | 35 | | I. * Tr. Eg. | | 3 | 7 | | I. Tr. In. | | 14 | 16 | | II. * Sh. Eg. | | | | | |
| 5 | 8 | 4 | 12.0 | I. Ec. Dis. | | 4 | 3 | | I. Sh. Eg. | | 16 | 34 | | I. Sh. In. | | | | | |
| | 8 | 40 | 56.5 | III. Ec. Dis. | | 5 | 25 | | I. Tr. Eg. | | 16 | 53 | | II. Tr. Eg. | | | | | |
| | 11 | 44 | | I. Oc. Re. | | 22 | 55 | 15.1 | I. Ec. Dis. | | 17 | 55 | | I. Tr. In. | | | | | |
| | 12 | 6 | 31.7 | III. Ec. Re. | 16 | 2 | 34 | | I. Oc. Re. | | 18 | 53 | | I. Sh. Eg. | | | | | |
| | 14 | 17 | | III. * Oc. Dis. | | 2 | 43 | | III. Sh. In. | | 20 | 13 | | I. Tr. Eg. | | | | | |
| | 17 | 43 | | III. Oc. Re. | | 6 | 18 | | III. Sh. Eg. | 26 | 13 | 46 | 24.7 | I. * Ec. Dis. | | | | | |
| | 22 | 37 | 41.1 | II. Ec. Dis. | | 8 | 21 | | III. Tr. In. | | 17 | 22 | | I. Oc. Re. | | | | | |
| 6 | 4 | 14 | | II. Oc. Re. | | 11 | 44 | | III. Tr. Eg. | | 20 | 41 | 45.8 | III. Ec. Dis. | | | | | |
| | 5 | 22 | | I. Sh. In. | | 14 | 29 | 50.4 | II. * Ec. Dis. | 27 | 0 | 5 | 32.0 | III. Ec. Re. | | | | | |
| | 6 | 45 | | I. Tr. In. | | 20 | 3 | | II. Oc. Re. | | 2 | 3 | | III. Oc. Dis. | | | | | |
| | 7 | 41 | | I. Sh. Eg. | | 20 | 12 | | I. Sh. In. | | 5 | 24 | | III. Oc. Re. | | | | | |
| | 9 | 4 | | I. Tr. Eg. | | 21 | 35 | | I. Tr. In. | | 6 | 21 | 46.6 | II. Ec. Dis. | | | | | |
| 7 | 2 | 32 | 38.4 | I. Ec. Dis. | | 22 | 31 | | I. Sh. Eg. | | 11 | 3 | | I. Sh. In. | | | | | |
| | 6 | 13 | | I. Oc. Re. | | 23 | 53 | | I. Tr. Eg. | | 11 | 48 | | II. Oc. Re. | | | | | |
| | 16 | 50 | | II. Sh. In. | 17 | 17 | 23 | 43.7 | I. Ec. Dis. | | 12 | 23 | | I. Tr. In. | | | | | |
| | 19 | 36 | | II. Tr. In. | | 21 | 3 | | I. Oc. Re. | | 13 | 22 | | I. * Sh. Eg. | | | | | |
| | 19 | 45 | | II. Sh. Eg. | 18 | 8 | 44 | | II. Sh. In. | 28 | 0 | 2 | | I. * Tr. Eg. | | | | | |
| | 22 | 29 | | II. Tr. Eg. | | 11 | 26 | | II. Tr. In. | | 4 | 31 | | IV. Sh. In. | | | | | |
| | 23 | 50 | | I. Sh. In. | | 11 | 39 | | II. Sh. Eg. | | 8 | 14 | 52.8 | IV. Sh. Eg. | | | | | |
| 8 | 1 | 13 | | I. Tr. In. | | 14 | 20 | | II. * Tr. Eg. | | 11 | 50 | | I. Ec. Dis. | | | | | |
| | 2 | 9 | | I. Sh. Eg. | | 14 | 41 | | I. * Sh. In. | | 12 | 34 | | I. Oc. Re. | | | | | |
| | 3 | 32 | | I. Tr. Eg. | | 16 | 3 | | I. Tr. In. | | 16 | 18 | | IV. * Tr. In. | | | | | |
| | 21 | 1 | 12.6 | I. Ec. Dis. | | 17 | 0 | | I. Sh. Eg. | | 16 | 18 | | IV. Tr. Eg. | | | | | |
| | 22 | 42 | | III. Sh. In. | | 18 | 21 | | I. Tr. Eg. | | 0 | 40 | | II. Sh. In. | | | | | |
| 9 | 0 | 41 | | I. Oc. Re. | 19 | 11 | 52 | 19.5 | I. Ec. Dis. | | 3 | 16 | | II. Tr. In. | | | | | |
| | 2 | 17 | | III. Sh. Eg. | | 13 | 30 | 57.6 | IV. * Ec. Dis. | | 3 | 35 | | II. Sh. Eg. | | | | | |
| | 4 | 23 | | III. Tr. In. | | 15 | 31 | | I. * Oc. Re. | | 5 | 31 | | I. Sh. In. | | | | | |
| | 7 | 48 | | III. Tr. Eg. | | 16 | 41 | 34.6 | III. Ec. Dis. | | 6 | 8 | | II. Tr. Eg. | | | | | |
| | 11 | 55 | 7.2 | II. Ec. Dis. | | 17 | 48 | 20.2 | IV. Ec. Re. | | 6 | 50 | | I. Tr. In. | | | | | |
| | 17 | 31 | | II. Oc. Re. | | 20 | 5 | 58.4 | III. Ec. Re. | | 7 | 50 | | I. Sh. Eg. | | | | | |
| | 18 | 19 | | I. Sh. In. | | 22 | 12 | | III. Oc. Dis. | | 9 | 8 | | I. Tr. Eg. | | | | | |
| | 19 | 42 | | I. Tr. In. | 20 | 1 | 35 | | III. Oc. Re. | 30 | 2 | 43 | 29.1 | I. Ec. Dis. | | | | | |
| | 20 | 38 | | I. Sh. Eg. | | 2 | 28 | | IV. Oc. Dis. | | 6 | 18 | | I. Oc. Re. | | | | | |
| | 22 | 0 | | I. Tr. Eg. | | 3 | 47 | 9.9 | II. Ec. Dis. | | 10 | 43 | | III. Sh. In. | | | | | |
| 10 | 15 | 29 | 40.6 | I. * Ec. Dis. | | 6 | 19 | | IV. Oc. Re. | | 14 | 17 | | III. * Sh. Eg. | | | | | |
| | 19 | 9 | | I. Oc. Re. | | 9 | 9 | | I. Sh. In. | | 16 | 3 | | III. Tr. In. | | | | | |
| 11 | 5 | 48 | | IV. Sh. In. | | 9 | 20 | | II. Oc. Re. | | 19 | 23 | | III. Tr. Eg. | | | | | |
| | 6 | 8 | | II. Sh. In. | | 10 | 31 | | I. Tr. In. | | 19 | 39 | 3.1 | II. Ec. Dis. | | | | | |
| | 8 | 54 | | II. Tr. In. | | 11 | 28 | | I. Sh. Eg. | | 23 | 59 | | I. Sh. In. | | | | | |
| | 9 | 3 | | II. Sh. Eg. | | | | | | | | | | | | | | | |

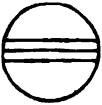
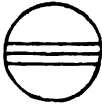

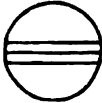
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

| | | | | | | |
|-----|--------|---|------|--------|--------|--|
| I. | d • |  | III. | d • | r • |  |
| II. | d • |  | IV. | d • | r • |  |

Configurations at 14^h for an Inverting Telescope.

| Day. | West. | | | | East. | | | |
|------|-------|---|-----|---|-------|-----|---|-----|
| 1 | | 4 | 2 | 1 | ○ | 3 | | |
| 2 | | | 4 3 | | ○ | 1 | | 2 ● |
| 3 | | 3 | | | ○ | 4 | 2 | 1 ● |
| 4 | | | 3 | 2 | 1 | ○ | 4 | |
| 5 | | | | 2 | 1 | ○ | | 4 |
| 6 | | | | 1 | ○ | 2 | 3 | 4 |
| 7 | | | | | ○ | 2 1 | 3 | 4 |
| 8 | | | 2 | 1 | ○ | 3 | | 4 |
| 9 | | | | 3 | 2 | ○ | 1 | 4 |
| 10 | | 3 | | 1 | ○ | 2 | 4 | |
| 11 | | | 3 | | 2 | ○ | 1 | 4 |
| 12 | | | | 4 | 3 | ○ | 1 | |
| 13 | | 4 | | 1 | ○ | 2 | 3 | |
| 14 | | | 4 | | ○ | 1 | 3 | |
| 15 | 4 | | 2 | 1 | ○ | 3 | | |
| 16 | | 4 | | | 2 | ○ | 1 | |
| 17 | | | 4 | 3 | | 1 | ○ | 2 |
| 18 | ○ 2 | | | 4 | | ○ | 1 | |
| 19 | | | | 2 | 4 | ○ | | 1 ● |
| 20 | | | | | 1 | ○ | 2 | 3 |
| 21 | | | | | ○ | 1 | 2 | 4 3 |
| 22 | | | | 2 | 1 | ○ | 3 | 4 |
| 23 | ○ 3 | | | | 2 | ○ | 1 | 4 |
| 24 | | | 3 | | 1 | ○ | 2 | 4 |
| 25 | | | | 3 | | ○ | 1 | 4 |
| 26 | | | | 2 | 3 | 1 | ○ | 4 |
| 27 | ○ 1 | | | | | ○ | 2 | 3 4 |
| 28 | ○ 4 | | | | | ○ | 1 | 2 3 |
| 29 | | | 4 | | 1 | ○ | 3 | |
| 30 | | 4 | | | 2 | ○ | 3 | 1 |

WASHINGTON MEAN TIME.

JULY.

| d | h | m | s | | d | h | m | s | | d | h | m | s | | d | h | m | s | |
|----|----|----|------|----------------|----|----|----|------|-----------------|----|----|----|------|-----------------|---|---|---|---|-----------------|
| 1 | 1 | 2 | | II. Oc. Re. | 11 | 14 | 50 | | I. * Sh. In. | 29 | 5 | 40 | | I. Sh. In. | | | | | I. Sh. In. |
| | 1 | 17 | | I. Tr. In. | | 16 | 1 | | I. * Tr. In. | | 6 | 17 | | III. Tr. Eg. | | | | | III. Tr. Eg. |
| | 2 | 18 | | I. Sh. Eg. | | 16 | 40 | | II. Oc. Re. | | 6 | 42 | | I. Tr. In. | | | | | I. Tr. In. |
| | 3 | 35 | | I. Tr. Eg. | | 17 | 9 | | I. Sh. Eg. | | 7 | 59 | | I. Sh. Eg. | | | | | I. Sh. Eg. |
| | 21 | 11 | 59.7 | I. Ec. Dis. | | 18 | 19 | | I. Tr. Eg. | | 8 | 13 | | II. Oc. Re. | | | | | II. Oc. Re. |
| 2 | 0 | 45 | | I. Oc. Re. | 19 | 12 | 3 | 19.8 | I. * Ec. Dis. | | 9 | 0 | | I. Tr. Eg. | | | | | I. Tr. Eg. |
| | 13 | 58 | | II. * Sh. In. | | 15 | 30 | | I. Oc. Re. | 33 | 1 | 56 | 32.0 | IV. Ec. Dis. | | | | | IV. Ec. Dis. |
| | 16 | 31 | | II. Tr. In. | 13 | 5 | 54 | | II. Sh. In. | | 2 | 54 | 53.6 | I. Ec. Dis. | | | | | I. Ec. Dis. |
| | 16 | 53 | | II. Sh. Eg. | | 8 | 12 | | II. Tr. In. | | 6 | 4 | 0.2 | IV. Ec. Re. | | | | | IV. Ec. Re. |
| | 18 | 28 | | I. Sh. In. | | 8 | 49 | | II. Sh. Eg. | | 6 | 12 | | I. Oc. Re. | | | | | I. Oc. Re. |
| | 19 | 23 | | II. Tr. Eg. | | 9 | 18 | | I. Sh. In. | | 11 | 41 | | IV. * Oc. Dis. | | | | | IV. * Oc. Dis. |
| | 19 | 45 | | I. Tr. In. | | 10 | 28 | | I. * Tr. In. | | 15 | 10 | | IV. * Oc. Re. | | | | | IV. * Oc. Re. |
| | 20 | 47 | | I. Sh. Eg. | | 11 | 3 | | II. * Tr. Eg. | | 21 | 50 | | II. Sh. In. | | | | | II. Sh. In. |
| | 22 | 3 | | I. Tr. Eg. | | 11 | 37 | | I. * Sh. Eg. | | 23 | 50 | | II. Tr. In. | | | | | II. Tr. In. |
| 3 | 15 | 40 | 35.6 | I. Ec. Dis. | | 12 | 46 | | I. * Tr. Eg. | 34 | 0 | 9 | | I. Sh. In. | | | | | I. Sh. In. |
| | 19 | 13 | | I. Oc. Re. | 14 | 6 | 31 | 58.2 | I. Ec. Dis. | | 0 | 44 | | II. Sh. Eg. | | | | | II. Sh. Eg. |
| 4 | 0 | 42 | 22.5 | III. Ec. Dis. | | 9 | 57 | | I. * Oc. Re. | | 1 | 9 | | I. Tr. In. | | | | | I. Tr. In. |
| | 4 | 5 | 29.9 | III. Ec. Re. | | 18 | 16 | | IV. Sh. In. | | 2 | 28 | | I. Sh. Eg. | | | | | I. Sh. Eg. |
| | 5 | 50 | | III. Oc. Dis. | | 18 | 43 | | III. Sh. In. | | 2 | 41 | | II. Tr. Eg. | | | | | II. Tr. Eg. |
| | 8 | 56 | 20.0 | II. Ec. Dis. | | 22 | 15 | | III. Sh. Eg. | | 3 | 27 | | I. Tr. Eg. | | | | | I. Tr. Eg. |
| | 9 | 10 | | III. Oc. Re. | | 22 | 42 | | IV. Sh. Eg. | | 21 | 23 | 33.2 | I. Ec. Dis. | | | | | I. Ec. Dis. |
| | 12 | 56 | | I. * Sh. In. | | 23 | 25 | | III. Tr. In. | 35 | 0 | 39 | | I. Oc. Re. | | | | | I. Oc. Re. |
| | 14 | 12 | | I. * Tr. In. | 15 | 0 | 48 | 6.1 | II. Ec. Dis. | | 12 | 45 | 18.7 | III. * Ec. Dis. | | | | | III. * Ec. Dis. |
| | 14 | 15 | | II. * Oc. Re. | | 2 | 43 | | III. Tr. Eg. | | 16 | 6 | 21.5 | III. * Ec. Re. | | | | | III. * Ec. Re. |
| | 15 | 15 | | I. * Sh. Eg. | | 3 | 47 | | I. Sh. In. | | 16 | 39 | 54.5 | II. Ec. Dis. | | | | | II. Ec. Dis. |
| | 16 | 30 | | I. Tr. Eg. | | 4 | 55 | | I. Tr. In. | | 16 | 42 | | III. Oc. Dis. | | | | | III. Oc. Dis. |
| 5 | 10 | 9 | 4.4 | I. * Ec. Dis. | | 5 | 13 | | IV. Tr. In. | | 18 | 37 | | I. Sh. In. | | | | | I. Sh. In. |
| | 13 | 41 | | I. * Oc. Re. | | 5 | 51 | | II. Oc. Re. | | 19 | 35 | | I. Tr. In. | | | | | I. Tr. In. |
| 6 | 3 | 17 | | II. Sh. In. | | 6 | 6 | | I. Sh. Eg. | | 19 | 59 | | III. Oc. Re. | | | | | III. Oc. Re. |
| | 5 | 45 | | II. Tr. In. | | 7 | 13 | | I. Tr. Eg. | | 20 | 56 | | I. Sh. Eg. | | | | | I. Sh. Eg. |
| | 6 | 12 | | II. Sh. Eg. | | 8 | 44 | | IV. Tr. Eg. | | 21 | 23 | | II. Oc. Re. | | | | | II. Oc. Re. |
| | 7 | 25 | | I. Sh. In. | 16 | 1 | 0 | 30.7 | I. Ec. Dis. | | 21 | 53 | | I. Tr. Eg. | | | | | I. Tr. Eg. |
| | 7 | 43 | 35.4 | IV. Ec. Dis. | | 4 | 24 | | I. Oc. Re. | 36 | 15 | 52 | 5.6 | I. * Ec. Dis. | | | | | I. * Ec. Dis. |
| | 8 | 36 | | II. Tr. Eg. | | 19 | 13 | | II. Sh. In. | | 19 | 6 | | I. Oc. Re. | | | | | I. Oc. Re. |
| | 8 | 40 | | I. Tr. In. | | 21 | 25 | | II. Tr. In. | 37 | 11 | 9 | | II. * Sh. In. | | | | | II. * Sh. In. |
| | 9 | 44 | | I. Sh. Eg. | | 22 | 7 | | II. Sh. Eg. | | 13 | 1 | | II. * Tr. In. | | | | | II. * Tr. In. |
| | 10 | 58 | | I. * Tr. Eg. | | 22 | 15 | | I. Sh. In. | | 13 | 6 | | I. * Sh. In. | | | | | I. * Sh. In. |
| | 11 | 56 | 10.4 | IV. * Ec. Re. | | 23 | 22 | | I. Tr. In. | | 14 | 1 | | I. * Tr. In. | | | | | I. * Tr. In. |
| | 19 | 35 | | IV. Oc. Dis. | 17 | 0 | 16 | | II. Tr. Eg. | | 14 | 3 | | II. * Sh. Eg. | | | | | II. * Sh. Eg. |
| | 23 | 13 | | IV. Oc. Re. | | 0 | 34 | | I. Sh. Eg. | | 15 | 25 | | I. * Sh. Eg. | | | | | I. * Sh. Eg. |
| 7 | 4 | 37 | 41.7 | I. Ec. Dis. | | 1 | 40 | | I. Tr. Eg. | | 15 | 52 | | II. * Tr. Eg. | | | | | II. * Tr. Eg. |
| | 8 | 8 | | I. Oc. Re. | | 19 | 29 | 8.8 | I. Ec. Dis. | | 16 | 19 | | I. Tr. Eg. | | | | | I. Tr. Eg. |
| | 14 | 43 | | III. * Sh. In. | | 22 | 51 | | I. Oc. Re. | 38 | 10 | 20 | 46.6 | I. * Ec. Dis. | | | | | I. * Ec. Dis. |
| | 18 | 16 | | III. Sh. Eg. | 18 | 8 | 44 | 26.2 | III. Ec. Dis. | | 13 | 32 | | I. * Oc. Re. | | | | | I. * Oc. Re. |
| | 19 | 46 | | III. Tr. In. | | 12 | 6 | 11.6 | III. * Ec. Re. | 39 | 2 | 45 | | III. Sh. In. | | | | | III. Sh. In. |
| | 22 | 13 | 35.1 | III. Ec. Dis. | | 13 | 9 | | III. * Oc. Dis. | | 5 | 57 | 11.0 | II. Ec. Dis. | | | | | II. Ec. Dis. |
| | 23 | 6 | | III. Tr. Eg. | | 14 | 5 | 22.2 | II. * Ec. Dis. | | 6 | 16 | | III. Sh. Eg. | | | | | III. Sh. Eg. |
| 8 | 1 | 53 | | I. Sh. In. | | 16 | 27 | | III. Oc. Re. | | 6 | 30 | | III. Tr. In. | | | | | III. Tr. In. |
| | 3 | 7 | | I. Tr. In. | | 16 | 43 | | I. Sh. In. | | 7 | 34 | | I. Sh. In. | | | | | I. Sh. In. |
| | 3 | 28 | | II. Oc. Re. | | 17 | 49 | | I. Tr. In. | | 8 | 28 | | I. Tr. In. | | | | | I. Tr. In. |
| | 4 | 12 | | I. Sh. Eg. | | 19 | 2 | | II. Oc. Re. | | 9 | 47 | | III. Tr. Eg. | | | | | III. Tr. Eg. |
| | 5 | 25 | | I. Tr. Eg. | | 19 | 2 | | I. Sh. Eg. | | 9 | 53 | | I. * Sh. Eg. | | | | | I. * Sh. Eg. |
| | 23 | 6 | 13.0 | I. Ec. Dis. | | 20 | 7 | | I. Tr. Eg. | | 10 | 32 | | II. * Oc. Re. | | | | | II. * Oc. Re. |
| 9 | 2 | 35 | | I. Oc. Re. | 19 | 13 | 57 | 40.1 | I. * Ec. Dis. | | 10 | 46 | | I. * Tr. Eg. | | | | | I. * Tr. Eg. |
| | 16 | 35 | | II. Sh. In. | | 17 | 18 | | I. Oc. Re. | 30 | 4 | 49 | 21.6 | I. Ec. Dis. | | | | | I. Ec. Dis. |
| | 18 | 59 | | II. Tr. In. | 20 | 8 | 32 | | II. Sh. In. | | 7 | 59 | | I. Oc. Re. | | | | | I. Oc. Re. |
| | 19 | 30 | | II. Sh. Eg. | | 10 | 38 | | II. * Tr. In. | 31 | 0 | 28 | | II. Sh. In. | | | | | II. Sh. In. |
| | 20 | 22 | | I. Sh. In. | | 11 | 12 | | I. * Sh. In. | | 2 | 3 | | I. Sh. In. | | | | | I. Sh. In. |
| | 21 | 34 | | I. Tr. In. | | 11 | 26 | | II. * Sh. Eg. | | 2 | 12 | | II. Tr. In. | | | | | II. Tr. In. |
| | 21 | 50 | | II. Tr. Eg. | | 12 | 16 | | I. * Tr. In. | | 2 | 55 | | I. Tr. In. | | | | | I. Tr. In. |
| | 22 | 41 | | I. Sh. Eg. | | 13 | 29 | | II. * Tr. Eg. | | 3 | 22 | | II. Sh. Eg. | | | | | II. Sh. Eg. |
| | 23 | 52 | | I. Tr. Eg. | | 13 | 31 | | I. * Sh. Eg. | | 4 | 22 | | I. Sh. Eg. | | | | | I. Sh. Eg. |
| 10 | 17 | 34 | 50.0 | I. Ec. Dis. | | 14 | 34 | | I. * Tr. Eg. | | 5 | 3 | | II. Tr. Eg. | | | | | II. Tr. Eg. |
| | 21 | 3 | | I. Oc. Re. | 21 | 8 | 26 | 19.8 | I. Ec. Dis. | | 5 | 13 | | I. Tr. Eg. | | | | | I. Tr. Eg. |
| 11 | 4 | 43 | 3.7 | III. Ec. Dis. | | 11 | 45 | | I. * Oc. Re. | | 12 | 31 | | IV. * Sh. In. | | | | | IV. * Sh. In. |
| | 8 | 5 | 30.7 | III. Ec. Re. | | 22 | 44 | | III. Sh. In. | | 16 | 51 | | IV. Sh. Eg. | | | | | IV. Sh. Eg. |
| | 9 | 32 | | III. Oc. Dis. | 22 | 2 | 16 | | III. Sh. Eg. | | 20 | 50 | | IV. Tr. In. | | | | | IV. Tr. In. |
| | 11 | 30 | 51.4 | II. * Ec. Dis. | | 3 | 0 | | III. Tr. In. | | 23 | 18 | 3.0 | I. Ec. Dis. | | | | | I. Ec. Dis. |
| | 12 | 50 | | III. * Oc. Re. | | 3 | 22 | 37.3 | II. Ec. Dis. | | | | | | | | | | |

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

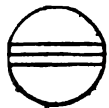
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.

d
•

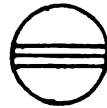
III.

d
•r
•

II.

d
•

IV.

d
•r
•*Configurations at 13^h 30^m for an Inverting Telescope.*

| Day. | West. | | | | East. | | | |
|------|------------------|----------------|----------------|---|----------------|----------------|----------------|------------------|
| 1 | 4 [•] | 3 [•] | 1 [•] | ○ | 2 [•] | | | |
| 2 | 4 [•] | 3 [•] | | ○ | 2 [•] | 1 [•] | | |
| 3 | 4 [•] | 2 [•] | 3 [•] | ○ | | | | |
| 4 | 4 [•] | | | ○ | 1 [•] | 3 [•] | | 2 [•] ● |
| 5 | | 4 [•] | | ○ | 2 [•] | 3 [•] | | 1 [•] ● |
| 6 | | | 1 [•] | ○ | | 3 [•] | | |
| 7 | | | 2 [•] | ○ | 3 [•] | 1 [•] | 4 [•] | |
| 8 | | 3 [•] | 1 [•] | ○ | 2 [•] | | 4 [•] | |
| 9 | | 3 [•] | | ○ | 1 [•] | | 4 [•] | |
| 10 | | 3 [•] | 1 [•] | ○ | | | 4 [•] | |
| 11 | | | 2 [•] | ○ | 3 [•] | 1 [•] | 4 [•] | |
| 12 | | | | ○ | 2 [•] | 3 [•] | 4 [•] | 1 [•] ● |
| 13 | | | 1 [•] | ○ | | 3 [•] | 4 [•] | |
| 14 | | 2 [•] | | ○ | 1 [•] | 3 [•] | 4 [•] | |
| 15 | | 3 [•] | 1 [•] | ○ | 2 [•] | | | |
| 16 | | 3 [•] | 4 [•] | ○ | 1 [•] | | | |
| 17 | 4 [•] | 3 [•] | 2 [•] | ○ | | | | |
| 18 | 4 [•] | | | ○ | 1 [•] | | | 3 [•] ● |
| 19 | 4 [•] | | | ○ | 2 [•] | 3 [•] | | |
| 20 | ○ 1 [•] | 4 [•] | | ○ | 2 [•] | 3 [•] | | |
| 21 | | 4 [•] | 2 [•] | ○ | 1 [•] | 3 [•] | | |
| 22 | | | 4 [•] | ○ | 2 [•] | | | |
| 23 | | 3 [•] | | ○ | 1 [•] | 2 [•] | | 4 [•] ● |
| 24 | | 3 [•] | 2 [•] | ○ | | 4 [•] | | |
| 25 | | | 2 [•] | ○ | 1 [•] | | 4 [•] | |
| 26 | | | 1 [•] | ○ | | 3 [•] | 4 [•] | |
| 27 | ○ 2 [•] | | | ○ | 1 [•] | 3 [•] | 4 [•] | |
| 28 | | 2 [•] | | ○ | 3 [•] | | 4 [•] | 1 [•] ● |
| 29 | | | 1 [•] | ○ | 2 [•] | | 4 [•] | |
| 30 | | 3 [•] | | ○ | 1 [•] | 2 [•] | 4 [•] | |
| 31 | | 3 [•] | 1 [•] | ○ | 4 [•] | | | |

WASHINGTON MEAN TIME.

AUGUST.

| d | h | m | s | | d | h | m | s | | d | h | m | s | | d | h | m | s | |
|----|----|----|------|-----------------|----|----|----|------|----------------|----|----|----|------|-----------------|---|---|---|---|--|
| 1 | 0 | 17 | | IV. Tr. Eg. | 10 | 19 | 19 | | II. Sh. Eg. | 21 | 8 | 21 | | II. * Sh. In. | | | | | |
| | 2 | 25 | | I. Oc. Re. | | 19 | 51 | | I. Tr. Eg. | | 9 | 9 | | II. * Tr. In. | | | | | |
| | 16 | 46 | 19.9 | III. * Ec. Dis. | | 20 | 33 | | II. Tr. Eg. | | 10 | 4 | | I. * Sh. Eg. | | | | | |
| | 19 | 14 | 29.7 | II. Ec. Dis. | 11 | 14 | 9 | 58.7 | I. * Ec. Dis. | | 10 | 27 | | I. * Tr. Eg. | | | | | |
| | 20 | 6 | 38.9 | III. Ec. Re. | | 17 | 3 | | I. Oc. Re. | | 11 | 14 | | II. * Sh. Eg. | | | | | |
| | 20 | 10 | | III. Oc. Dis. | 12 | 10 | 47 | | III. * Sh. In. | | 12 | 0 | | II. * Tr. Eg. | | | | | |
| | 20 | 31 | | I. Sh. In. | | 11 | 6 | 31.4 | II. * Ec. Dis. | 22 | 5 | 2 | 11.3 | I. Ec. Dis. | | | | | |
| | 21 | 22 | | I. Tr. In. | | 11 | 22 | | I. * Sh. In. | | 7 | 40 | | I. * Oc. Re. | | | | | |
| | 22 | 50 | | I. Sh. Eg. | | 11 | 59 | | I. * Tr. In. | 23 | 2 | 13 | | I. Sh. In. | | | | | |
| | 23 | 27 | | III. Oc. Re. | | 13 | 18 | | III. * Tr. In. | | 2 | 34 | | I. Tr. In. | | | | | |
| | 23 | 40 | | I. Tr. Eg. | | 13 | 41 | | I. * Sh. Eg. | | 2 | 58 | 48.6 | II. Ec. Dis. | | | | | |
| | 23 | 41 | | II. Oc. Re. | | 14 | 16 | | III. * Sh. Eg. | | 4 | 32 | | I. Sh. Eg. | | | | | |
| 2 | 17 | 46 | 36.9 | I. Ec. Dis. | | 14 | 17 | | I. * Tr. Eg. | | 4 | 49 | 25.6 | III. Ec. Dis. | | | | | |
| | 20 | 52 | | I. Oc. Re. | | 15 | 6 | | II. * Oc. Re. | | 4 | 52 | | I. Tr. Eg. | | | | | |
| 3 | 13 | 47 | | II. * Sh. In. | | 16 | 35 | | III. * Tr. Eg. | | 6 | 27 | | II. Oc. Re. | | | | | |
| | 15 | 0 | | I. * Sh. In. | 13 | 8 | 38 | 37.2 | I. * Ec. Dis. | | 9 | 29 | | III. * Oc. Re. | | | | | |
| | 15 | 22 | | II. * Tr. In. | | 11 | 30 | | I. * Oc. Re. | | 23 | 30 | 50.1 | I. Ec. Dis. | | | | | |
| | 15 | 49 | | I. * Tr. In. | 14 | 5 | 44 | | II. Sh. In. | 24 | 2 | 6 | | I. Oc. Re. | | | | | |
| | 16 | 41 | | II. * Sh. Eg. | | 5 | 51 | | I. Sh. In. | | 20 | 42 | | I. Sh. In. | | | | | |
| | 17 | 19 | | I. Sh. Eg. | | 6 | 25 | | I. Tr. In. | | 21 | 0 | | I. Tr. In. | | | | | |
| | 18 | 7 | | I. Tr. Eg. | | 6 | 51 | | II. Tr. In. | | 21 | 40 | | II. Sh. In. | | | | | |
| | 18 | 13 | | II. Tr. Eg. | | 8 | 10 | | I. * Sh. Eg. | | 22 | 17 | | II. Tr. In. | | | | | |
| 4 | 12 | 15 | 19.5 | I. * Ec. Dis. | | 8 | 38 | | II. * Sh. Eg. | | 23 | 1 | | I. Sh. Eg. | | | | | |
| | 15 | 18 | | I. * Oc. Re. | | 8 | 43 | | I. * Tr. Eg. | | 23 | 18 | | I. Tr. Eg. | | | | | |
| 5 | 6 | 46 | | III. Sh. In. | | 9 | 42 | | II. * Tr. Eg. | 25 | 0 | 33 | | II. Sh. Eg. | | | | | |
| | 8 | 31 | 48.4 | II. * Ec. Dis. | 15 | 3 | 7 | 22.0 | I. Ec. Dis. | | 1 | 8 | | II. Tr. Eg. | | | | | |
| | 9 | 28 | | I. * Sh. In. | | 5 | 56 | | I. Oc. Re. | | 14 | 25 | 54.5 | IV. * Ec. Dis. | | | | | |
| | 9 | 54 | | III. * Tr. In. | 16 | 0 | 19 | | I. Sh. In. | | 17 | 59 | 37.2 | I. Ec. Dis. | | | | | |
| | 10 | 15 | | I. * Tr. In. | | 0 | 23 | 55.2 | II. Ec. Dis. | | 20 | 32 | | I. Oc. Re. | | | | | |
| | 10 | 17 | | III. * Sh. Eg. | | 0 | 48 | 0.2 | III. Ec. Dis. | | 20 | 43 | | IV. Oc. Re. | | | | | |
| | 11 | 47 | | I. * Sh. Eg. | | 0 | 51 | | I. Tr. In. | 26 | 15 | 10 | | I. * Sh. In. | | | | | |
| | 12 | 33 | | I. * Tr. Eg. | | 2 | 38 | | I. Sh. Eg. | | 15 | 26 | | I. * Tr. In. | | | | | |
| | 12 | 50 | | II. * Oc. Re. | | 3 | 9 | | I. Tr. Eg. | | 16 | 16 | 18.7 | II. * Ec. Dis. | | | | | |
| | 13 | 13 | | III. * Tr. Eg. | | 4 | 13 | | II. Oc. Re. | | 17 | 29 | | I. Sh. Eg. | | | | | |
| 6 | 6 | 43 | 56.4 | I. Ec. Dis. | | 6 | 11 | | III. Oc. Re. | | 17 | 44 | | I. Tr. Eg. | | | | | |
| | 9 | 45 | | I. * Oc. Re. | | 21 | 35 | 59.2 | I. Ec. Dis. | | 18 | 48 | | III. Sh. In. | | | | | |
| 7 | 3 | 6 | | II. Sh. In. | 17 | 0 | 22 | | I. Oc. Re. | | 19 | 34 | | II. Oc. Re. | | | | | |
| | 3 | 57 | | I. Sh. In. | | 6 | 47 | | IV. Sh. In. | | 19 | 53 | | III. Tr. In. | | | | | |
| | 4 | 32 | | II. Tr. In. | | 11 | 1 | | IV. * Sh. Eg. | | 22 | 16 | | III. Sh. Eg. | | | | | |
| | 4 | 41 | | I. Tr. In. | | 11 | 35 | | IV. * Tr. In. | | 23 | 10 | | III. Tr. Eg. | | | | | |
| | 6 | 0 | | II. Sh. Eg. | | 15 | 6 | | IV. * Tr. Eg. | 27 | 12 | 28 | 19.2 | I. * Ec. Dis. | | | | | |
| | 6 | 16 | | I. Sh. Eg. | | 18 | 48 | | I. Sh. In. | | 14 | 58 | | I. * Oc. Re. | | | | | |
| | 6 | 59 | | I. Tr. Eg. | | 19 | 2 | | II. Sh. In. | 28 | 9 | 39 | | I. * Sh. In. | | | | | |
| | 7 | 23 | | II. Tr. Eg. | | 19 | 17 | | I. Tr. In. | | 9 | 52 | | I. * Tr. In. | | | | | |
| 8 | 1 | 12 | 39.2 | I. Ec. Dis. | | 20 | 0 | | II. Tr. In. | | 10 | 59 | | II. * Sh. In. | | | | | |
| | 4 | 11 | | I. Oc. Re. | | 21 | 7 | | I. Sh. Eg. | | 11 | 25 | | II. * Tr. In. | | | | | |
| | 20 | 10 | 47.6 | IV. Ec. Dis. | | 21 | 35 | | I. Tr. Eg. | | 11 | 58 | | I. * Sh. Eg. | | | | | |
| | 20 | 47 | 5.8 | III. Ec. Dis. | | 21 | 56 | | II. Sh. Eg. | | 12 | 10 | | I. * Tr. Eg. | | | | | |
| | 21 | 49 | 9.4 | II. Ec. Dis. | | 22 | 51 | | II. Tr. Eg. | | 13 | 52 | | II. * Sh. Eg. | | | | | |
| | 22 | 25 | | I. Sh. In. | 18 | 16 | 4 | 44.6 | I. * Ec. Dis. | | 14 | 16 | | II. * Tr. Eg. | | | | | |
| | 23 | 7 | | I. Tr. In. | | 18 | 48 | | I. Oc. Re. | 29 | 6 | 57 | 7.8 | I. Ec. Dis. | | | | | |
| 9 | 0 | 12 | 20.6 | IV. Ec. Re. | 19 | 13 | 16 | | I. * Sh. In. | | 9 | 24 | | I. * Oc. Re. | | | | | |
| | 0 | 44 | | I. Sh. Eg. | | 13 | 41 | 21.1 | II. * Ec. Dis. | 30 | 4 | 7 | | I. Sh. In. | | | | | |
| | 1 | 25 | | I. Tr. Eg. | | 13 | 43 | | I. * Tr. In. | | 4 | 18 | | I. Tr. In. | | | | | |
| | 1 | 58 | | II. Oc. Re. | | 14 | 48 | | III. * Sh. In. | | 5 | 33 | 50.5 | II. Ec. Dis. | | | | | |
| | 2 | 47 | | IV. Oc. Dis. | | 15 | 35 | | I. * Sh. Eg. | | 6 | 26 | | I. Sh. Eg. | | | | | |
| | 2 | 50 | | III. Oc. Re. | | 16 | 1 | | I. * Tr. Eg. | | 6 | 36 | | I. Tr. Eg. | | | | | |
| | 6 | 17 | | IV. Oc. Re. | | 16 | 37 | | III. * Tr. In. | | 8 | 41 | | II. * Oc. Re. | | | | | |
| | 19 | 41 | 14.7 | I. Ec. Dis. | | 17 | 21 | | II. Oc. Re. | | 8 | 50 | 57.1 | III. * Ec. Dis. | | | | | |
| | 22 | 37 | | I. Oc. Re. | | 18 | 16 | | III. Sh. Eg. | | 12 | 45 | | III. * Oc. Re. | | | | | |
| 10 | 16 | 25 | | II. * Sh. In. | | 19 | 54 | | III. Tr. Eg. | 31 | 1 | 25 | 48.8 | I. Ec. Dis. | | | | | |
| | 16 | 54 | | I. Sh. In. | 20 | 10 | 33 | 24.8 | I. * Ec. Dis. | | 3 | 50 | | I. Oc. Re. | | | | | |
| | 17 | 33 | | I. Tr. In. | | 13 | 14 | | I. * Oc. Re. | | 22 | 36 | | I. Sh. In. | | | | | |
| | 17 | 42 | | II. Tr. In. | 21 | 7 | 45 | | I. * Sh. In. | | 22 | 44 | | I. Tr. In. | | | | | |
| | 19 | 13 | | I. Sh. Eg. | | 8 | 9 | | I. * Tr. In. | | | | | | | | | | |

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.



III.



II.



IV.

*Configurations at 12^h 30^m for an Inverting Telescope.*

| Day. | West. | | | | East. | | | |
|------|-------|----|----------|---|-------|-------|-------|-------|
| 1 | | | 4' 2' 3' | ○ | 1' | | | |
| 2 | | 4' | | ○ | 1' | | | |
| 3 | | 4' | | ○ | 1' | | 3' | |
| 4 | | 4' | | ○ | | 3' | | |
| 5 | ○ 1' | 4' | | ○ | | | | 3' |
| 6 | | 4' | 3' | ○ | 1' | 2' | | |
| 7 | | | 4' | ○ | | | | |
| 8 | | | 4' | ○ | 1' | | | |
| 9 | | | 1' | ○ | 4' | 3' 2' | | |
| 10 | | | | ○ | 1' | | 4' 3' | |
| 11 | | | 2' | ○ | | 3' | 4' | |
| 12 | ○ 1' | | | ○ | 3' | | | 4' 3' |
| 13 | | | 3' | ○ | 1' | 2' | | 4' |
| 14 | | | 3' | ○ | | | 4' | |
| 15 | | | 1' | ○ | 1' | | 4' | |
| 16 | | | 1' | ○ | 3' 2' | 4' | | |
| 17 | ○ 4' | | | ○ | 1' | | 3' | |
| 18 | | | 4' 2' | ○ | | 3' | | |
| 19 | | 4' | | ○ | 1' | | | |
| 20 | | 4' | 3' | ○ | | 2' | | 1' |
| 21 | | 4' | 3' | ○ | | | | |
| 22 | | 4' | 3' | ○ | 1' | | | |
| 23 | | 4' | 1' | ○ | 3' | 2' | | |
| 24 | | | 4' | ○ | 1' | | 3' | |
| 25 | | | 2' | ○ | | 3' | | |
| 26 | | | | ○ | 1' 3' | 4' | | |
| 27 | | | 3' | ○ | | 2' | 4' | |
| 28 | ○ 2' | | 3' | ○ | | | | 4' |
| 29 | | | 3' 2' | ○ | 1' | | | 4' |
| 30 | | | 1' | ○ | 2' | | 4' | 3' |
| 31 | | | | ○ | 12' | 3' | 4' | |

WASHINGTON MEAN TIME.

SEPTEMBER.

| d | h | m | s | | d | h | m | s | | d | h | m | s | | d | h | m | s | |
|----|----|----|------|----------------|----|----|----|------|----------------|----|----|----|------|---------------|----|----|----|------|---------------|
| 1 | 0 | 19 | | II. Sh. In. | 10 | 16 | 8 | | I. Oc. Dis. | 20 | 12 | 10 | | I. *Sh. Eg. | 20 | 12 | 10 | | I. *Sh. Eg. |
| | 0 | 23 | | II. Tr. In. | | 18 | 32 | 52.7 | I. Ea. Re. | | 12 | 30 | | II. *Oc. Dis. | | 12 | 30 | | II. *Oc. Dis. |
| | 0 | 55 | | I. Sh. Eg. | 11 | 7 | 16 | | IV. *Oc. Dis. | | 16 | 5 | 50.5 | II. Ea. Re. | | 16 | 5 | 50.5 | II. Ea. Re. |
| | 1 | 2 | | I. Tr. Eg. | | 12 | 30 | 27.6 | IV. *Ec. Re. | | 19 | 15 | | III. Oc. Dis. | | 19 | 15 | | III. Oc. Dis. |
| | 3 | 12 | | II. Sh. Eg. | | 13 | 18 | | I. *Tr. In. | 21 | 0 | 11 | 27.9 | III. Ea. Re. | | 0 | 11 | 27.9 | III. Ea. Re. |
| | 3 | 24 | | II. Tr. Eg. | | 13 | 28 | | I. *Sh. In. | | 6 | 45 | | I. *Oc. Dis. | | 6 | 45 | | I. *Oc. Dis. |
| | 19 | 54 | 37.6 | I. Ea. Dis. | | 15 | 36 | | I. *Tr. Eg. | 22 | 9 | 25 | 39.2 | I. *Ec. Re. | | 9 | 25 | 39.2 | I. *Ec. Re. |
| | 22 | 16 | | I. Oc. Re. | | 15 | 47 | | I. *Sh. Eg. | | 3 | 54 | | I. Tr. In. | | 3 | 54 | | I. Tr. In. |
| 2 | 17 | 5 | | I. Sh. In. | | 15 | 57 | | II. *Tr. In. | | 4 | 20 | | I. Sh. In. | | 4 | 20 | | I. Sh. In. |
| | 17 | 9 | | I. Tr. In. | | 16 | 16 | | II. Sh. In. | | 6 | 12 | | I. Tr. Eg. | | 6 | 12 | | I. Tr. Eg. |
| | 18 | 51 | 25.6 | II. Ea. Dis. | | 18 | 48 | | II. Tr. Eg. | | 6 | 39 | | I. *Sh. Eg. | | 6 | 39 | | I. *Sh. Eg. |
| | 19 | 24 | | I. Sh. Eg. | | 19 | 9 | | II. Sh. Eg. | | 7 | 22 | | II. *Tr. In. | | 7 | 22 | | II. *Tr. In. |
| | 19 | 27 | | I. Tr. Eg. | 12 | 10 | 34 | | I. *Oc. Dis. | | 8 | 14 | | II. *Sh. In. | | 8 | 14 | | II. *Sh. In. |
| | 21 | 47 | | II. Oc. Re. | | 13 | 1 | 43.1 | I. *Ec. Re. | | 10 | 13 | | II. *Tr. Eg. | | 10 | 13 | | II. *Tr. Eg. |
| | 22 | 49 | | III. Sh. In. | 13 | 7 | 44 | | I. *Tr. In. | | 11 | 6 | | II. *Sh. Eg. | | 11 | 6 | | II. *Sh. Eg. |
| | 23 | 8 | | III. Tr. In. | | 7 | 57 | | I. *Sh. In. | 23 | 1 | 11 | | I. Oc. Dis. | | 1 | 11 | | I. Oc. Dis. |
| 3 | 1 | 3 | | IV. Sh. In. | | 10 | 2 | | I. *Tr. Eg. | | 3 | 54 | 31.2 | I. Ea. Re. | | 3 | 54 | 31.2 | I. Ea. Re. |
| | 1 | 52 | | IV. Tr. In. | | 10 | 16 | | I. *Sh. Eg. | | 22 | 20 | | I. Tr. In. | | 22 | 20 | | I. Tr. In. |
| | 2 | 16 | | III. Sh. Eg. | | 10 | 16 | | II. *Oc. Dis. | | 22 | 49 | | I. Sh. In. | | 22 | 49 | | I. Sh. In. |
| | 2 | 26 | | III. Tr. Eg. | | 13 | 30 | 26.4 | II. *Ec. Re. | 24 | 0 | 38 | | I. Tr. Eg. | | 0 | 38 | | I. Tr. Eg. |
| | 5 | 12 | | IV. Sh. Eg. | | 15 | 58 | | III. *Oc. Dis. | | 1 | 8 | | I. Sh. Eg. | | 1 | 8 | | I. Sh. Eg. |
| | 5 | 25 | | IV. Tr. Eg. | | 20 | 10 | 26.0 | III. Ea. Re. | | 1 | 38 | | II. Oc. Dis. | | 1 | 38 | | II. Oc. Dis. |
| | 14 | 23 | 21.4 | I. *Ec. Dis. | 14 | 5 | 0 | | I. Oc. Dis. | | 5 | 23 | 37.8 | II. Ea. Re. | | 5 | 23 | 37.8 | II. Ea. Re. |
| | 16 | 42 | | I. Oc. Re. | | 7 | 39 | 26.1 | I. *Ec. Re. | | 8 | 57 | | III. *Tr. In. | | 8 | 57 | | III. *Tr. In. |
| 4 | 11 | 33 | | I. *Sh. In. | 15 | 2 | 10 | | I. Tr. In. | | 10 | 55 | | III. *Sh. In. | | 10 | 55 | | III. *Sh. In. |
| | 11 | 35 | | I. *Tr. In. | | 2 | 25 | | I. Sh. In. | | 12 | 19 | | III. *Tr. Eg. | | 12 | 19 | | III. *Tr. Eg. |
| | 13 | 38 | | II. *Sh. In. | | 4 | 28 | | I. Tr. Eg. | | 14 | 20 | | III. *Sh. Eg. | | 14 | 20 | | III. *Sh. Eg. |
| | 13 | 41 | | II. *Tr. In. | | 4 | 44 | | I. Sh. Eg. | | 19 | 37 | | I. Oc. Dis. | | 19 | 37 | | I. Oc. Dis. |
| | 13 | 52 | | I. *Sh. Eg. | | 5 | 5 | | II. Tr. In. | | 22 | 23 | 18.6 | I. Ea. Re. | | 22 | 23 | 18.6 | I. Ea. Re. |
| | 13 | 53 | | I. *Tr. Eg. | | 5 | 35 | | II. Sh. In. | 25 | 16 | 47 | | I. Tr. In. | | 16 | 47 | | I. Tr. In. |
| | 16 | 31 | | II. Sh. Eg. | | 7 | 56 | | II. *Tr. Eg. | | 17 | 18 | | I. Sh. In. | | 17 | 18 | | I. Sh. In. |
| | 16 | 32 | | II. Tr. Eg. | | 8 | 28 | | II. *Sh. Eg. | | 19 | 5 | | I. Tr. Eg. | | 19 | 5 | | I. Tr. Eg. |
| 5 | 8 | 50 | | I. *Oc. Dis. | | 23 | 26 | | I. Oc. Dis. | | 19 | 37 | | I. Sh. Eg. | | 19 | 37 | | I. Sh. Eg. |
| | 11 | 8 | | I. *Oc. Re. | 16 | 1 | 59 | 16.7 | I. Ea. Re. | | 20 | 31 | | II. Tr. In. | | 20 | 31 | | II. Tr. In. |
| 6 | 6 | 1 | | I. Tr. In. | | 20 | 36 | | I. Tr. In. | | 21 | 33 | | II. Sh. In. | | 21 | 33 | | II. Sh. In. |
| | 6 | 2 | | I. Sh. In. | | 20 | 54 | | I. Sh. In. | | 23 | 23 | | II. Tr. Eg. | | 23 | 23 | | II. Tr. Eg. |
| | 8 | 3 | | II. *Oc. Dis. | | 22 | 54 | | I. Tr. Eg. | 26 | 0 | 25 | | II. Sh. Eg. | | 0 | 25 | | II. Sh. Eg. |
| | 8 | 19 | | I. *Tr. Eg. | | 23 | 13 | | I. Sh. Eg. | | 14 | 3 | | I. *Oc. Dis. | | 14 | 3 | | I. *Oc. Dis. |
| | 8 | 21 | | I. *Sh. Eg. | | 23 | 23 | | II. Oc. Dis. | | 16 | 52 | 12.2 | I. Ea. Re. | | 16 | 52 | 12.2 | I. Ea. Re. |
| | 10 | 55 | 14.4 | II. *Ec. Re. | 17 | 2 | 48 | 7.6 | II. Ea. Re. | 27 | 11 | 13 | | I. *Tr. In. | | 11 | 13 | | I. *Tr. In. |
| | 12 | 43 | | III. *Oc. Dis. | | 5 | 39 | | III. Tr. In. | | 11 | 46 | | I. *Sh. In. | | 11 | 46 | | I. *Sh. In. |
| | 16 | 9 | 31.1 | III. Ea. Re. | | 6 | 52 | | III. *Sh. In. | | 13 | 31 | | I. *Tr. Eg. | | 13 | 31 | | I. *Tr. Eg. |
| 7 | 3 | 16 | | I. Oc. Dis. | | 8 | 59 | | III. *Tr. Eg. | | 14 | 5 | | I. *Sh. Eg. | | 14 | 5 | | I. *Sh. Eg. |
| | 5 | 35 | 19.5 | I. Ea. Re. | | 10 | 18 | | III. *Sh. Eg. | | 14 | 46 | | II. *Oc. Dis. | | 14 | 46 | | II. *Oc. Dis. |
| 8 | 0 | 27 | | I. Tr. In. | | 17 | 52 | | I. Oc. Dis. | | 18 | 41 | 27.4 | II. Ea. Re. | | 18 | 41 | 27.4 | II. Ea. Re. |
| | 0 | 31 | | I. Sh. In. | | 20 | 28 | 2.4 | I. Ea. Re. | | 21 | 30 | | IV. Oc. Dis. | | 21 | 30 | | IV. Oc. Dis. |
| | 2 | 45 | | I. Tr. Eg. | 18 | 15 | 2 | | I. *Tr. In. | | 22 | 34 | | III. Oc. Dis. | | 22 | 34 | | III. Oc. Dis. |
| | 2 | 49 | | II. Tr. In. | | 15 | 23 | | I. *Sh. In. | 28 | 1 | 18 | | IV. Oc. Re. | | 1 | 18 | | IV. Oc. Re. |
| | 2 | 50 | | I. Sh. Eg. | | 17 | 20 | | I. Tr. Eg. | | 2 | 59 | 11.0 | IV. Ea. Dis. | | 2 | 59 | 11.0 | IV. Ea. Dis. |
| | 2 | 57 | | II. Sh. In. | | 17 | 42 | | I. Sh. Eg. | | 4 | 12 | 15.0 | III. Ea. Re. | | 4 | 12 | 15.0 | III. Ea. Re. |
| | 5 | 40 | | II. Tr. Eg. | | 18 | 13 | | II. Tr. In. | | 6 | 40 | 36.2 | IV. *Ec. Re. | | 6 | 40 | 36.2 | IV. *Ec. Re. |
| | 5 | 50 | | II. Sh. Eg. | | 18 | 54 | | II. Sh. In. | | 8 | 30 | | I. *Oc. Dis. | | 8 | 30 | | I. *Oc. Dis. |
| | 21 | 42 | | I. *Oc. Dis. | | 21 | 4 | | II. Tr. Eg. | | 11 | 20 | 58.5 | I. *Ec. Re. | | 11 | 20 | 58.5 | I. *Ec. Re. |
| 9 | 0 | 4 | 8.4 | I. Ea. Re. | | 21 | 47 | | II. Sh. Eg. | 29 | 5 | 39 | | I. Tr. In. | | 5 | 39 | | I. Tr. In. |
| | 18 | 53 | | I. Tr. In. | 19 | 12 | 18 | | I. *Oc. Dis. | | 6 | 15 | | I. Sh. In. | | 6 | 15 | | I. Sh. In. |
| | 18 | 59 | | I. Sh. In. | | 14 | 56 | 54.6 | I. *Ec. Re. | | 7 | 57 | | I. *Tr. Eg. | | 7 | 57 | | I. *Tr. Eg. |
| | 21 | 9 | | II. Oc. Dis. | | 16 | 2 | | IV. Tr. In. | | 8 | 34 | | I. *Sh. Eg. | | 8 | 34 | | I. *Sh. Eg. |
| | 21 | 11 | | I. Tr. Eg. | | 19 | 21 | | IV. Sh. In. | | 9 | 40 | | II. *Tr. In. | | 9 | 40 | | II. *Tr. In. |
| | 21 | 18 | | I. Sh. Eg. | | 19 | 44 | | IV. Tr. Eg. | | 10 | 52 | | II. *Sh. In. | | 10 | 52 | | II. *Sh. In. |
| 10 | 0 | 12 | 49.7 | II. Ea. Re. | | 23 | 22 | | IV. Sh. Eg. | | 12 | 32 | | II. *Tr. Eg. | | 12 | 32 | | II. *Tr. Eg. |
| | 2 | 23 | | III. Tr. In. | 20 | 9 | 28 | | I. *Tr. In. | | 13 | 44 | | II. *Sh. Eg. | | 13 | 44 | | II. *Sh. Eg. |
| | 2 | 51 | | III. Sh. In. | | 9 | 51 | | I. *Sh. In. | 30 | 2 | 56 | | I. Oc. Dis. | | 2 | 56 | | I. Oc. Dis. |
| | 5 | 42 | | III. Tr. Eg. | | 11 | 46 | | I. *Tr. Eg. | | 5 | 49 | 51.7 | I. Ea. Re. | | 5 | 49 | 51.7 | I. Ea. Re. |
| | 6 | 17 | | III. Sh. Eg. | | | | | | | | | | | | | | | |

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.



III.



II.



IV.

*Configurations at 11^h for an Inverting Telescope.*

| Day. | West. | East. |
|------|------------|---------|
| 1 | 2. 1 | 5. 4 |
| 2 | 2 | 1. 3 |
| 3 | 3. 4. 1 | 2 |
| 4 | 1. 4. 3. 2 | 2 |
| 5 | 4. 3. 2 | 1. 3 |
| 6 | 4. 1. 3 | 2 |
| 7 | 4 | 1. 2. 3 |
| 8 | 4. 1. 3 | 3 |
| 9 | 4. 2 | 1. 2 |
| 10 | 4. 1. 3 | 2 |
| 11 | 3 | 1. 3 |
| 12 | 3. 2 | 4 |
| 13 | 3. 1 | 4 |
| 14 | 1. 2 | 1. 3. 4 |
| 15 | 2 | 1. 3. 4 |
| 16 | 1. 3 | 2. 4 |
| 17 | 3 | 1. 2. 4 |
| 18 | 3. 2. 1 | 4 |
| 19 | 1. 3. 2 | 1. 3. 2 |
| 20 | 1. 3. 2 | 3 |
| 21 | 4. 2 | 1. 3 |
| 22 | 3. 1 | 2 |
| 23 | 4. 3. 2 | 1. 2 |
| 24 | 4. 2. 1 | 3 |
| 25 | 3. 4. 2 | 1 |
| 26 | 1. 3. 2 | 4 |
| 27 | 2 | 1. 3. 4 |
| 28 | 1. 3 | 2 |
| 29 | 2 | 1. 3. 4 |
| 30 | 2 | 1. 3. 4 |

WASHINGTON MEAN TIME.

OCTOBER.

| d | h | m | s | | d | h | m | s | | d | h | m | s | | d | h | m | s | |
|----|----|----|------|---------------|----|----|----|------|----------------|----|----|----|------|---------------|---|---|---|---|--|
| 1 | 0 | 5 | | I. Tr. In. | 11 | 17 | 54 | | I. Sh. Eg. | 22 | 8 | 47 | | I. *Sh. Eg. | | | | | |
| | 0 | 44 | | I. Sh. In. | | 19 | 21 | | II. Oc. Dis. | | 10 | 53 | | II. *Oc. Dis. | | | | | |
| | 2 | 23 | | I. Tr. Eg. | | 23 | 53 | 20.4 | II. Ec. Re. | | 15 | 47 | 47.3 | II. Ec. Re. | | | | | |
| | 3 | 2 | | I. Sh. Eg. | 19 | 5 | 22 | | III. Oc. Dis. | | 21 | 59 | | IV. Tr. In. | | | | | |
| | 3 | 54 | | II. Oc. Dis. | | 8 | 47 | | III. *Oc. Re. | | 22 | 41 | | III. Tr. In. | | | | | |
| | 7 | 59 | 20.7 | II. *Ec. Re. | | 9 | 2 | 45.7 | III. *Ec. Dis. | 23 | 2 | 0 | | IV. Tr. Eg. | | | | | |
| | 12 | 17 | | III. *Tr. In. | | 12 | 2 | | I. *Oc. Dis. | | 2 | 7 | | III. Tr. Eg. | | | | | |
| | 14 | 57 | | III. Sh. In. | | 12 | 14 | 34.3 | III. *Ec. Re. | | 2 | 45 | | I. Oc. Dis. | | | | | |
| | 15 | 40 | | III. Tr. Eg. | | 15 | 11 | 51.3 | I. Ec. Re. | | 3 | 2 | | III. Sh. In. | | | | | |
| | 18 | 21 | | III. Sh. Eg. | 13 | 9 | 11 | | I. *Tr. In. | | 6 | 5 | 11.6 | I. *Ec. Re. | | | | | |
| | 21 | 23 | | I. Oc. Dis. | | 10 | 5 | | I. *Sh. In. | | 6 | 23 | | III. *Sh. Eg. | | | | | |
| 2 | 0 | 18 | 40.3 | I. Ec. Re. | | 11 | 29 | | I. *Tr. Eg. | | 8 | 0 | | IV. *Sh. In. | | | | | |
| | 18 | 31 | | I. Tr. In. | | 12 | 23 | | I. *Sh. Eg. | | 11 | 46 | | IV. *Sh. Eg. | | | | | |
| | 19 | 12 | | I. Sh. In. | | 14 | 20 | | II. Tr. In. | | 23 | 53 | | I. Tr. In. | | | | | |
| | 20 | 49 | | I. Tr. Eg. | | 16 | 9 | | II. Sh. In. | 24 | 0 | 58 | | I. Sh. In. | | | | | |
| | 21 | 30 | | I. Sh. Eg. | | 17 | 13 | | II. Tr. Eg. | | 2 | 12 | | I. Tr. Eg. | | | | | |
| | 22 | 50 | | II. Tr. In. | | 19 | 1 | | II. Sh. Eg. | | 3 | 16 | | I. Sh. Eg. | | | | | |
| 3 | 0 | 11 | | II. Sh. In. | 14 | 6 | 29 | | I. *Oc. Dis. | | 5 | 56 | | II. Tr. In. | | | | | |
| | 1 | 42 | | II. Tr. Eg. | | 9 | 40 | 46.4 | I. *Ec. Re. | | 8 | 6 | | II. *Sh. In. | | | | | |
| | 3 | 3 | | II. Sh. Eg. | | 12 | 22 | | IV. *Oc. Dis. | | 8 | 49 | | II. *Tr. Eg. | | | | | |
| | 15 | 49 | | I. Oc. Dis. | | 16 | 20 | | IV. Oc. Re. | | 10 | 57 | | II. *Sh. Eg. | | | | | |
| | 18 | 47 | 35.0 | I. Ec. Re. | | 21 | 17 | 35.1 | IV. Ec. Dis. | | 21 | 12 | | I. Oc. Dis. | | | | | |
| 4 | 12 | 58 | | I. *Tr. In. | 15 | 0 | 51 | 5.5 | IV. Ec. Re. | 25 | 0 | 34 | 9.1 | I. Ec. Re. | | | | | |
| | 13 | 41 | | I. *Sh. In. | | 3 | 38 | | I. Tr. In. | | 18 | 20 | | I. Tr. In. | | | | | |
| | 15 | 16 | | I. Tr. Eg. | | 4 | 34 | | I. Sh. In. | | 19 | 27 | | I. Sh. In. | | | | | |
| | 15 | 59 | | I. Sh. Eg. | | 5 | 56 | | I. Tr. Eg. | | 20 | 39 | | I. Tr. Eg. | | | | | |
| | 17 | 2 | | II. Oc. Dis. | | 6 | 52 | | I. *Sh. Eg. | | 21 | 45 | | I. Sh. Eg. | | | | | |
| | 21 | 17 | 17.1 | II. Ec. Re. | | 8 | 31 | | II. *Oc. Dis. | 26 | 0 | 5 | | II. Oc. Dis. | | | | | |
| 5 | 1 | 56 | | III. Oc. Dis. | | 13 | 11 | 25.4 | II. *Ec. Re. | | 5 | 6 | 6.0 | II. Ec. Re. | | | | | |
| | 8 | 13 | 9.6 | III. *Ec. Re. | | 19 | 9 | | III. Tr. In. | | 12 | 29 | | III. Oc. Dis. | | | | | |
| | 10 | 16 | | I. *Oc. Dis. | | 22 | 34 | | III. Tr. Eg. | | 15 | 40 | | I. Oc. Dis. | | | | | |
| | 13 | 16 | 22.7 | I. *Ec. Re. | | 23 | 0 | | III. Sh. In. | | 15 | 55 | | III. Oc. Re. | | | | | |
| 6 | 6 | 37 | | IV. *Tr. In. | 16 | 0 | 56 | | I. Oc. Dis. | | 17 | 8 | 11.0 | III. Ec. Dis. | | | | | |
| | 7 | 25 | | I. *Tr. In. | | 2 | 22 | | III. Sh. Eg. | | 19 | 2 | 59.9 | I. Ec. Re. | | | | | |
| | 8 | 10 | | I. *Sh. In. | | 4 | 9 | 37.0 | I. Ec. Re. | | 20 | 18 | 3.4 | III. Ec. Re. | | | | | |
| | 9 | 43 | | I. *Tr. Eg. | | 22 | 5 | | I. Tr. In. | 27 | 12 | 48 | | I. *Tr. In. | | | | | |
| | 10 | 28 | | I. *Sh. Eg. | | 23 | 3 | | I. Sh. In. | | 13 | 56 | | I. *Sh. In. | | | | | |
| | 10 | 30 | | IV. *Tr. Eg. | 17 | 0 | 23 | | I. Tr. Eg. | | 15 | 6 | | I. Tr. Eg. | | | | | |
| | 12 | 0 | | II. *Tr. In. | | 1 | 21 | | I. Sh. Eg. | | 16 | 14 | | I. Sh. Eg. | | | | | |
| | 13 | 30 | | II. *Sh. In. | | 3 | 31 | | II. Tr. In. | | 19 | 9 | | II. Tr. In. | | | | | |
| | 13 | 40 | | IV. *Sh. In. | | 5 | 28 | | II. Sh. In. | | 21 | 25 | | II. Sh. In. | | | | | |
| | 14 | 52 | | II. Tr. Eg. | | 6 | 24 | | II. *Tr. Eg. | | 22 | 2 | | II. Tr. Eg. | | | | | |
| | 16 | 22 | | II. Sh. Eg. | | 8 | 20 | | II. *Sh. Eg. | 28 | 0 | 16 | | II. Sh. Eg. | | | | | |
| | 17 | 34 | | IV. Sh. Eg. | | 19 | 23 | | I. Oc. Dis. | | 10 | 7 | | I. *Oc. Dis. | | | | | |
| 7 | 4 | 42 | | I. Oc. Dis. | | 22 | 38 | 34.0 | I. Ec. Re. | | 13 | 31 | 56.4 | I. *Ec. Re. | | | | | |
| | 7 | 45 | 17.0 | I. *Ec. Re. | 18 | 16 | 32 | | I. Tr. In. | 29 | 7 | 16 | | I. *Tr. In. | | | | | |
| 8 | 1 | 51 | | I. Tr. In. | | 17 | 32 | | I. Sh. In. | | 8 | 25 | | I. *Sh. In. | | | | | |
| | 2 | 39 | | I. Sh. In. | | 18 | 50 | | I. Tr. Eg. | | 9 | 35 | | I. *Tr. Eg. | | | | | |
| | 4 | 9 | | I. Tr. Eg. | | 19 | 50 | | I. Sh. Eg. | | 10 | 43 | | I. *Sh. Eg. | | | | | |
| | 4 | 57 | | I. Sh. Eg. | | 21 | 41 | | II. Oc. Dis. | | 13 | 17 | | II. *Oc. Dis. | | | | | |
| | 6 | 11 | | II. *Oc. Dis. | 19 | 2 | 29 | 36.6 | II. Ec. Re. | | 18 | 24 | 21.4 | II. Ec. Re. | | | | | |
| | 10 | 35 | 16.1 | II. *Ec. Re. | | 8 | 53 | | III. *Oc. Dis. | 30 | 2 | 19 | | III. Tr. In. | | | | | |
| | 15 | 41 | | III. Tr. In. | | 12 | 18 | | III. Oc. Re. | | 4 | 35 | | I. Oc. Dis. | | | | | |
| | 18 | 58 | | III. Sh. In. | | 13 | 5 | 8.6 | III. Ec. Dis. | | 5 | 46 | | III. Tr. Eg. | | | | | |
| | 19 | 5 | | III. Tr. Eg. | | 13 | 50 | | I. Oc. Dis. | | 7 | 5 | | III. *Sh. In. | | | | | |
| | 22 | 22 | | III. Sh. Eg. | | 16 | 15 | 59.8 | III. Ec. Re. | | 8 | 0 | 48.6 | I. *Ec. Re. | | | | | |
| | 23 | 9 | | I. Oc. Dis. | | 17 | 7 | 23.9 | I. Ec. Re. | | 10 | 25 | | III. *Sh. Eg. | | | | | |
| 9 | 2 | 14 | 6.6 | I. Ec. Re. | 20 | 10 | 59 | | I. *Tr. In. | 31 | 1 | 43 | | I. Tr. In. | | | | | |
| | 20 | 18 | | I. Tr. In. | | 12 | 1 | | I. *Sh. In. | | 2 | 54 | | I. Sh. In. | | | | | |
| | 21 | 8 | | I. Sh. In. | | 13 | 18 | | I. *Tr. Eg. | | 4 | 2 | | I. Tr. Eg. | | | | | |
| | 22 | 36 | | I. Tr. Eg. | | 14 | 19 | | I. Sh. Eg. | | 4 | 13 | | IV. Oc. Dis. | | | | | |
| | 23 | 26 | | I. Sh. Eg. | | 16 | 43 | | II. Tr. In. | | 5 | 12 | | I. Sh. Eg. | | | | | |
| 10 | 1 | 10 | | II. Tr. In. | | 18 | 47 | | II. Sh. In. | | 8 | 17 | | IV. *Oc. Re. | | | | | |
| | 2 | 49 | | II. Sh. In. | | 19 | 36 | | II. Tr. Eg. | | 8 | 23 | | II. *Tr. In. | | | | | |
| | 4 | 2 | | II. Tr. Eg. | | 21 | 38 | | II. Sh. Eg. | | 10 | 44 | | II. *Sh. In. | | | | | |
| | 5 | 41 | | II. Sh. Eg. | 21 | 8 | 18 | | I. *Oc. Dis. | | 11 | 16 | | II. *Tr. Eg. | | | | | |
| | 17 | 36 | | I. Oc. Dis. | | 11 | 36 | 20.0 | I. *Ec. Re. | | 13 | 35 | | II. *Sh. Eg. | | | | | |
| | 20 | 43 | 2.5 | I. Ec. Re. | 22 | 5 | 26 | | I. Tr. In. | | 15 | 36 | 38.5 | IV. Ec. Dis. | | | | | |
| 11 | 14 | 45 | | I. Tr. In. | | 6 | 29 | | I. *Sh. In. | | 19 | 1 | 42.5 | IV. Ec. Re. | | | | | |
| | 15 | 36 | | I. Sh. In. | | 7 | 45 | | I. *Tr. Eg. | | 23 | 1 | | I. Oc. Dis. | | | | | |
| | 17 | 3 | | I. Tr. Eg. | | | | | | | | | | | | | | | |

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

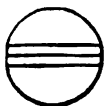
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

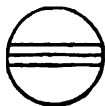
I.



r

•

III.



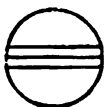
d

•

r

•

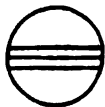
II.



r

•

IV.



d

•

r

•

Configurations at 9^h 30^m for an Inverting Telescope.

| Day. | West. | | East. | |
|------|-------|-------|---------------|----------|
| 1 | | 1° | ○ 3° 2' | 4° |
| 2 | | 3° | ○ | 1° 2' 4° |
| 3 | 3° | 2° 1' | ○ | 4° |
| 4 | | 3° 2' | ○ 1° | 4° |
| 5 | | | ○ 3° 4° | 1° ● |
| 6 | | 1° 2' | ○ 2° | 3° |
| 7 | | 4° 2° | ○ 1° | 3° |
| 8 | 4° | 1° | ○ 2° 3° | |
| 9 | 4° | 3° | ○ | 1° 2° |
| 10 | 4° | 3° | ○ | |
| 11 | 4° | 3° 2° | ○ 1° | |
| 12 | 4° | | ○ 3° 2° | |
| 13 | | 4° | ○ 1° 2° | 3° |
| 14 | | 2° | 4° ○ 1° | 3° |
| 15 | | 1° | ○ 3° 4° | 2° ● |
| 16 | | 3° | ○ | 1° 2° 4° |
| 17 | | 3° | 1° 2° ○ | 4° |
| 18 | | 3° 2° | ○ 1° | 4° |
| 19 | | 1° | ○ 2° | 4° 3° ● |
| 20 | | | ○ 1° 2° 3° 4° | |
| 21 | | 2° | ○ | 4° 1° ● |
| 22 | | 1° 2° | ○ 4° 3° | |
| 23 | | 4° | ○ 1° 2° | |
| 24 | | 4° | 1° 2° ○ | |
| 25 | 4° | 3° 2° | ○ 1° | |
| 26 | 4° | 1° 3° | ○ 2° | |
| 27 | 4° | | ○ 1° 2° 3° | |
| 28 | 4° | 2° | 1° ○ | 3° |
| 29 | ○ 1° | 4° | 2° ○ | 3° |
| 30 | | 4° 3° | ○ 1° 2° | |
| 31 | ○ 2° | 3° | 1° ○ 4° | |

WASHINGTON MEAN TIME.

NOVEMBER.

| d | h | m | s | | d | h | m | s | | d | h | m | s | | d | h | m | s | |
|----|----|------|------|----------------|----|----|----|------|----------------|----|----|----|------|-----------------|----|----|----|------|-----------------|
| 1 | 2 | 29 | 46.6 | I. Ec. Re. | 11 | 0 | 7 | | II. Tr. In. | 20 | 22 | 30 | | III. Sh. Eg. | 20 | 22 | 30 | | III. Sh. Eg. |
| 20 | 10 | | | I. Tr. In. | | 2 | 41 | | II. Sh. In. | 21 | 7 | 20 | | I. * Tr. In. | 21 | 7 | 20 | | I. * Tr. In. |
| 21 | 22 | | | I. Sh. In. | | 3 | 0 | | II. Tr. Eg. | | 8 | 41 | | I. * Sh. In. | | 8 | 41 | | I. * Sh. In. |
| 22 | 29 | | | I. Tr. Eg. | | 5 | 32 | | II. * Sh. Eg. | | 9 | 39 | | I. * Tr. Eg. | | 9 | 39 | | I. * Tr. Eg. |
| 23 | 40 | | | I. Sh. Eg. | | 13 | 50 | | I. Oc. Dis. | | 10 | 59 | | I. * Sh. Eg. | | 10 | 59 | | I. * Sh. Eg. |
| 2 | 2 | 31 | | II. Oc. Dis. | | 17 | 23 | 13.9 | I. Ec. Re. | | 15 | 56 | | II. Tr. In. | | 15 | 56 | | II. Tr. In. |
| 7 | 42 | 47.6 | | II. * Ec. Re. | 13 | 10 | 58 | | I. * Tr. In. | | 18 | 38 | | II. Sh. In. | | 18 | 38 | | II. Sh. In. |
| 16 | 9 | | | III. Oc. Dis. | | 12 | 16 | | I. * Sh. In. | | 18 | 49 | | II. Tr. Eg. | | 18 | 49 | | II. Tr. Eg. |
| 17 | 20 | | | I. Oc. Dis. | | 13 | 17 | | I. Tr. Eg. | | 21 | 29 | | II. Sh. Eg. | | 21 | 29 | | II. Sh. Eg. |
| 19 | 36 | | | III. Oc. Re. | | 14 | 34 | | I. Sh. Eg. | 22 | 4 | 40 | | I. Oc. Dis. | | 4 | 40 | | I. Oc. Dis. |
| 20 | 58 | 38.8 | | I. Ec. Re. | | 18 | 14 | | II. Oc. Dis. | | 8 | 16 | 44.7 | I. * Ec. Re. | | 8 | 16 | 44.7 | I. * Ec. Re. |
| 21 | 10 | 40.4 | | III. Ec. Dis. | | 23 | 38 | 5.1 | II. Ec. Re. | 23 | 1 | 49 | | I. Tr. In. | | 1 | 49 | | I. Tr. In. |
| 3 | 0 | 19 | 32.8 | III. Ec. Re. | 13 | 8 | 18 | | I. * Oc. Dis. | | 3 | 10 | | I. Sh. In. | | 3 | 10 | | I. Sh. In. |
| 14 | 38 | | | I. Tr. In. | | 9 | 52 | | III. * Tr. In. | | 4 | 8 | | I. Tr. Eg. | | 4 | 8 | | I. Tr. Eg. |
| 15 | 51 | | | I. Sh. In. | | 11 | 52 | 6.8 | I. * Ec. Re. | | 5 | 28 | | I. * Sh. Eg. | | 5 | 28 | | I. * Sh. Eg. |
| 16 | 57 | | | I. Tr. Eg. | | 13 | 19 | | III. Tr. Eg. | | 10 | 4 | | II. * Oc. Dis. | | 10 | 4 | | II. * Oc. Dis. |
| 18 | 9 | | | I. Sh. Eg. | | 15 | 11 | | III. Sh. In. | | 15 | 34 | 1.9 | II. Ec. Re. | | 15 | 34 | 1.9 | II. Ec. Re. |
| 21 | 37 | | | II. Tr. In. | | 18 | 29 | | III. Sh. Eg. | | 23 | 9 | | I. Oc. Dis. | | 23 | 9 | | I. Oc. Dis. |
| 4 | 0 | 3 | | II. Sh. In. | 14 | 5 | 26 | | I. * Tr. In. | 24 | 2 | 45 | 36.7 | I. Ec. Re. | | 2 | 45 | 36.7 | I. Ec. Re. |
| 0 | 30 | | | II. Tr. Eg. | | 6 | 45 | | I. * Sh. In. | | 3 | 41 | | III. Oc. Dis. | | 3 | 41 | | III. Oc. Dis. |
| 2 | 54 | | | II. Sh. Eg. | | 7 | 45 | | I. * Tr. Eg. | | 7 | 9 | | III. * Ec. Re. | | 7 | 9 | | III. * Ec. Re. |
| 11 | 58 | | | I. * Oc. Dis. | | 9 | 3 | | I. * Sh. Eg. | | 9 | 17 | 44.0 | III. * Ec. Dis. | | 9 | 17 | 44.0 | III. * Ec. Dis. |
| 15 | 27 | 34.5 | | I. Ec. Re. | | 13 | 23 | | II. Tr. In. | | 12 | 23 | 29.6 | III. Ec. Re. | | 12 | 23 | 29.6 | III. Ec. Re. |
| 5 | 9 | 6 | | I. * Tr. In. | | 16 | 0 | | II. Sh. In. | | 20 | 17 | | I. Tr. In. | | 20 | 17 | | I. Tr. In. |
| 10 | 20 | | | I. * Sh. In. | | 16 | 16 | | II. Tr. Eg. | | 21 | 39 | | I. Sh. In. | | 21 | 39 | | I. Sh. In. |
| 11 | 25 | | | I. * Tr. Eg. | | 18 | 51 | | II. Sh. Eg. | | 22 | 36 | | I. Tr. Eg. | | 22 | 36 | | I. Tr. Eg. |
| 12 | 38 | | | I. Sh. Eg. | 15 | 2 | 47 | | I. Oc. Dis. | | 23 | 57 | | I. Sh. Eg. | | 23 | 57 | | I. Sh. Eg. |
| 15 | 44 | | | II. Oc. Dis. | | 6 | 21 | 5.1 | I. * Ec. Re. | 25 | 5 | 13 | | II. Tr. In. | | 5 | 13 | | II. Tr. In. |
| 21 | 1 | 7.4 | | II. Ec. Re. | | 23 | 55 | | I. Tr. In. | | 7 | 47 | | IV. * Tr. In. | | 7 | 47 | | IV. * Tr. In. |
| 6 | 6 | 3 | | III. * Tr. In. | 16 | 1 | 14 | | I. Sh. In. | | 7 | 57 | | II. * Sh. In. | | 7 | 57 | | II. * Sh. In. |
| 6 | 26 | | | I. * Oc. Dis. | | 2 | 14 | | I. Tr. Eg. | | 8 | 6 | | II. * Tr. Eg. | | 8 | 6 | | II. * Tr. Eg. |
| 9 | 30 | | | III. * Tr. Eg. | | 3 | 32 | | I. Sh. Eg. | | 10 | 47 | | II. * Sh. Eg. | | 10 | 47 | | II. * Sh. Eg. |
| 9 | 56 | 27.2 | | I. * Ec. Re. | | 7 | 30 | | II. * Oc. Dis. | | 11 | 58 | | IV. * Tr. Eg. | | 11 | 58 | | IV. * Tr. Eg. |
| 11 | 7 | | | III. * Sh. In. | | 12 | 56 | 46.0 | II. Ec. Re. | | 17 | 38 | | I. Oc. Dis. | | 17 | 38 | | I. Oc. Dis. |
| 14 | 27 | | | III. Sh. Eg. | | 21 | 6 | | IV. Oc. Dis. | | 20 | 41 | | IV. Sh. In. | | 20 | 41 | | IV. Sh. In. |
| 7 | 3 | 34 | | I. Tr. In. | | 21 | 15 | | I. Oc. Dis. | | 21 | 14 | 32.7 | I. Ec. Re. | | 21 | 14 | 32.7 | I. Ec. Re. |
| 4 | 49 | | | I. Sh. In. | | 23 | 45 | | III. Oc. Dis. | 26 | 0 | 10 | | IV. Sh. Eg. | | 0 | 10 | | IV. Sh. Eg. |
| 5 | 53 | | | I. * Tr. Eg. | 17 | 0 | 49 | 56.8 | I. Ec. Re. | | 14 | 46 | | I. Tr. In. | | 14 | 46 | | I. Tr. In. |
| 7 | 7 | | | I. * Sh. Eg. | | 1 | 15 | | IV. Oc. Re. | | 16 | 7 | | I. Sh. In. | | 16 | 7 | | I. Sh. In. |
| 10 | 52 | | | II. * Tr. In. | | 3 | 13 | | III. Oc. Re. | | 17 | 5 | | I. Tr. Eg. | | 17 | 5 | | I. Tr. Eg. |
| 13 | 22 | | | II. Sh. In. | | 5 | 15 | 25.9 | III. Ec. Dis. | | 18 | 25 | | I. Sh. Eg. | | 18 | 25 | | I. Sh. Eg. |
| 13 | 45 | | | II. Tr. Eg. | | 8 | 22 | 14.9 | III. * Ec. Re. | | 23 | 21 | | II. Ec. Dis. | | 23 | 21 | | II. Ec. Dis. |
| 16 | 13 | | | II. Sh. Eg. | | 9 | 56 | 48.4 | IV. * Ec. Dis. | 27 | 4 | 52 | 32.6 | II. Ec. Re. | | 4 | 52 | 32.6 | II. Ec. Re. |
| 8 | 0 | 54 | | I. Oc. Dis. | | 13 | 12 | 47.2 | IV. Ec. Re. | | 12 | 7 | | I. * Oc. Dis. | | 12 | 7 | | I. * Oc. Dis. |
| 4 | 25 | 25.5 | | I. Ec. Re. | | 18 | 23 | | I. Tr. In. | | 15 | 43 | 25.6 | I. Ec. Re. | | 15 | 43 | 25.6 | I. Ec. Re. |
| 14 | 21 | | | IV. Tr. In. | | 19 | 43 | | I. Sh. In. | | 17 | 42 | | III. Tr. In. | | 17 | 42 | | III. Tr. In. |
| 18 | 20 | | | IV. Tr. Eg. | | 20 | 42 | | I. Tr. Eg. | | 21 | 11 | | III. Tr. Eg. | | 21 | 11 | | III. Tr. Eg. |
| 22 | 2 | | | I. Tr. In. | | 22 | 1 | | I. Sh. Eg. | | 23 | 16 | | III. Sh. In. | | 23 | 16 | | III. Sh. In. |
| 23 | 18 | | | I. Sh. In. | 18 | 2 | 39 | | II. Tr. In. | | 2 | 32 | | III. Sh. Eg. | | 2 | 32 | | III. Sh. Eg. |
| 9 | 0 | 21 | | I. Tr. Eg. | | 5 | 19 | | II. * Sh. In. | | 9 | 15 | | I. * Tr. In. | | 9 | 15 | | I. * Tr. In. |
| 1 | 36 | | | I. Sh. Eg. | | 5 | 32 | | II. * Tr. Eg. | | 10 | 36 | | I. * Sh. In. | | 10 | 36 | | I. * Sh. In. |
| 2 | 20 | | | IV. Sh. In. | | 8 | 10 | | II. * Sh. Eg. | | 11 | 34 | | I. * Tr. Eg. | | 11 | 34 | | I. * Tr. Eg. |
| 4 | 59 | | | II. Oc. Dis. | | 15 | 43 | | I. Oc. Dis. | | 12 | 54 | | I. Sh. Eg. | | 12 | 54 | | I. Sh. Eg. |
| 5 | 58 | | | IV. * Sh. Eg. | | 19 | 18 | 53.4 | I. Ec. Re. | | 18 | 31 | | II. Tr. In. | | 18 | 31 | | II. Tr. In. |
| 10 | 19 | 41.0 | | II. * Ec. Re. | 19 | 12 | 52 | | I. Tr. In. | | 21 | 16 | | II. Sh. In. | | 21 | 16 | | II. Sh. In. |
| 19 | 22 | | | I. Oc. Dis. | | 14 | 12 | | I. Sh. In. | | 21 | 24 | | II. Tr. Eg. | | 21 | 24 | | II. Tr. Eg. |
| 19 | 54 | | | III. Oc. Dis. | | 15 | 11 | | I. Tr. Eg. | 29 | 0 | 6 | | II. Sh. Eg. | | 0 | 6 | | II. Sh. Eg. |
| 22 | 54 | 17.2 | | I. Ec. Re. | | 16 | 30 | | I. Sh. Eg. | | 6 | 35 | | I. * Oc. Dis. | | 6 | 35 | | I. * Oc. Dis. |
| 23 | 22 | | | III. Oc. Re. | | 20 | 46 | | II. Oc. Dis. | | 10 | 12 | 23.3 | I. * Ec. Re. | | 10 | 12 | 23.3 | I. * Ec. Re. |
| 10 | 1 | 13 | 11.5 | III. Ec. Dis. | 20 | 2 | 15 | 13.2 | II. Ec. Re. | 30 | 3 | 44 | | I. Tr. In. | | 3 | 44 | | I. Tr. In. |
| 4 | 21 | 2.7 | | III. Ec. Re. | | 10 | 12 | | I. * Oc. Dis. | | 5 | 5 | | I. Sh. In. | | 5 | 5 | | I. Sh. In. |
| 16 | 30 | | | I. Tr. In. | | 13 | 45 | | III. Tr. In. | | 6 | 3 | | I. * Tr. Eg. | | 6 | 3 | | I. * Tr. Eg. |
| 17 | 47 | | | I. Sh. In. | | 13 | 47 | 46.3 | I. Ec. Re. | | 7 | 23 | | I. * Sh. Eg. | | 7 | 23 | | I. * Sh. Eg. |
| 18 | 49 | | | I. Tr. Eg. | | 17 | 13 | | III. Tr. Eg. | | 12 | 40 | | II. Oc. Dis. | | 12 | 40 | | II. Oc. Dis. |
| 20 | 5 | | | I. Sh. Eg. | | 19 | 13 | | III. Sh. In. | | 18 | 11 | 27.8 | II. Ec. Re. | | 18 | 11 | 27.8 | II. Ec. Re. |

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

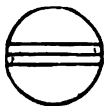
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

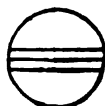
NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

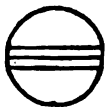
I.

r
•

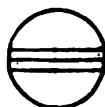
III.

d
• r
•

II.

r
•

IV.

d
• r
•*Configurations at 8^h for an Inverting Telescope.*

| Day. | West. | | East. |
|------|---------------|---|-------------|
| 1 | •3 •2 | ○ | •1 •4 |
| 2 | | ○ | •2 •4 |
| 3 | | ○ | 1' 2' 3' 4' |
| 4 | 2' •1 | ○ | 3' •4 |
| 5 | ○ 1' •2 | ○ | 3' 4' |
| 6 | ○ 3' | ○ | •2 4' •1● |
| 7 | 3' 1' ○2' | ○ | 4' |
| 8 | •3 •2 | ○ | 4' •1 |
| 9 | 4' 1' ○2 | ○ | |
| 10 | 4' ○ | ○ | 1' 2' 3' |
| 11 | 4' 1' 2' ○ | ○ | •3 |
| 12 | 4' •2 | ○ | 1' 3' |
| 13 | •4 | ○ | 1' 2' 3' •2 |
| 14 | •4 3' 1' ○2' | ○ | |
| 15 | 4' 2' ○ | ○ | •1 |
| 16 | •3 4' 1' ○ | ○ | •2● |
| 17 | | ○ | 3' 1' 2' |
| 18 | 1' 2' ○ | ○ | 4' 3' |
| 19 | •2 ○ | ○ | 1' 3' •4 |
| 20 | 1' ○ | ○ | 3' 2' •4 |
| 21 | ○ 1' 3' ○ | ○ | 2' 4' |
| 22 | 3' 2' ○ | ○ | •1 4' |
| 23 | •3 1' 2' ○ | ○ | 4' |
| 24 | | ○ | 3' 1' 2' 4' |
| 25 | ○ 4' 1' 2' ○ | ○ | •3 |
| 26 | 4' 2' ○ | ○ | 1' 3' |
| 27 | 4' 1' ○ | ○ | 2' 3' |
| 28 | 4' 3' ○ | ○ | 1' 2' |
| 29 | 4' 3' 2' ○ | ○ | •1● |
| 30 | •4 •3 •2 1' ○ | ○ | |

WASHINGTON MEAN TIME.

DECEMBER.

| d | h | m | s | | d | h | m | s | | d | h | m | s | | d | h | m | s | |
|----|----|----|------|----------------|----|----|----|------|---------------|----|----|----|------|----------------|---|---|---|---|--|
| 1 | 1 | 4 | | I. Oc. Dis. | 11 | 15 | 59 | | I. Oc. Dis. | 21 | 10 | 53 | | I. *Sh. In. | | | | | |
| | 4 | 41 | 15.0 | I. Ec. Re. | | 19 | 34 | 37.9 | I. Ec. Re. | | 11 | 54 | | I. Tr. Eg. | | | | | |
| | 7 | 41 | | III. *Oc. Dis. | 19 | 1 | 51 | | III. Tr. In. | | 13 | 10 | | I. Sh. Eg. | | | | | |
| | 11 | 9 | | III. *Oc. Re. | | 2 | 12 | | IV. Tr. In. | | 20 | 41 | | II. Oc. Dis. | | | | | |
| | 13 | 20 | 29.1 | III. Ec. Dis. | | 5 | 19 | | III. *Tr. Eg. | 22 | 2 | 4 | 37.4 | II. Ec. Re. | | | | | |
| | 16 | 25 | 10.9 | III. Ec. Re. | | 6 | 22 | | IV. *Tr. Eg. | | 6 | 56 | | I. *Oc. Dis. | | | | | |
| | 22 | 13 | | I. Tr. In. | | 7 | 20 | | III. *Sh. In. | | 10 | 27 | 56.5 | I. *Ec. Re. | | | | | |
| | 23 | 34 | | I. Sh. In. | | 10 | 34 | | III. *Sh. Eg. | | 20 | 7 | | III. Oc. Dis. | | | | | |
| 2 | 0 | 32 | | I. Tr. Eg. | | 13 | 7 | | I. Tr. In. | | 23 | 34 | | III. Oc. Re. | | | | | |
| | 1 | 52 | | I. Sh. Eg. | | 14 | 28 | | I. Sh. In. | 23 | 1 | 28 | 54.6 | III. Ec. Dis. | | | | | |
| | 7 | 50 | | II. *Tr. In. | | 15 | 3 | | IV. Sh. In. | | 4 | 5 | | I. Tr. In. | | | | | |
| | 10 | 35 | | II. *Sh. In. | | 15 | 26 | | I. Tr. Eg. | | 4 | 30 | 17.6 | III. Ec. Re. | | | | | |
| | 10 | 43 | | II. *Tr. Eg. | | 16 | 45 | | I. Sh. Eg. | | 5 | 22 | | I. *Sh. In. | | | | | |
| | 13 | 25 | | II. Sh. Eg. | | 18 | 22 | | IV. Sh. Eg. | | 6 | 24 | | I. *Tr. Eg. | | | | | |
| | 19 | 33 | | I. Oc. Dis. | | 23 | 48 | | II. Tr. In. | | 7 | 39 | | I. *Sh. Eg. | | | | | |
| | 23 | 10 | 10.5 | I. Ec. Re. | 13 | 2 | 31 | | II. Sh. In. | | 15 | 51 | | II. Tr. In. | | | | | |
| 3 | 15 | 2 | | IV. Oc. Dis. | | 2 | 41 | | II. Tr. Eg. | | 18 | 27 | | II. Sh. In. | | | | | |
| | 16 | 42 | | I. Tr. In. | | 5 | 20 | | II. *Sh. Eg. | | 18 | 44 | | II. Tr. Eg. | | | | | |
| | 18 | 3 | | I. Sh. In. | | 10 | 28 | | I. *Oc. Dis. | | 21 | 16 | | II. Sh. Eg. | | | | | |
| | 19 | 1 | | I. Tr. Eg. | | 14 | 3 | 34.6 | I. Ec. Re. | 24 | 1 | 25 | | I. Oc. Dis. | | | | | |
| | 19 | 13 | | IV. Oc. Re. | 14 | 7 | 37 | | I. *Tr. In. | | 4 | 56 | 49.5 | I. Ec. Re. | | | | | |
| | 20 | 21 | | I. Sh. Eg. | | 8 | 57 | | I. *Sh. In. | | 22 | 34 | | I. Tr. In. | | | | | |
| 4 | 1 | 58 | | II. Oc. Dis. | | 9 | 56 | | I. *Tr. Eg. | | 23 | 51 | | I. Sh. In. | | | | | |
| | 4 | 17 | 28.0 | IV. Ec. Dis. | | 11 | 14 | | I. *Sh. Eg. | 25 | 0 | 53 | | I. Tr. Eg. | | | | | |
| | 7 | 23 | 37.2 | IV. *Ec. Re. | | 17 | 59 | | II. Oc. Dis. | | 2 | 8 | | I. Sh. Eg. | | | | | |
| | 7 | 30 | 1.1 | II. *Ec. Re. | | 23 | 26 | 46.4 | II. Ec. Re. | | 10 | 3 | | II. *Oc. Dis. | | | | | |
| | 14 | 2 | | I. Oc. Dis. | 15 | 4 | 58 | | I. Oc. Dis. | | 15 | 23 | 16.0 | II. Ec. Re. | | | | | |
| | 17 | 39 | 2.7 | I. Ec. Re. | | 8 | 32 | 25.5 | I. *Ec. Re. | | 19 | 55 | | I. Oc. Dis. | | | | | |
| | 21 | 44 | | III. Tr. In. | | 15 | 54 | | III. Oc. Dis. | | 23 | 25 | 39.6 | I. Ec. Re. | | | | | |
| 5 | 1 | 12 | | III. Tr. Eg. | | 19 | 22 | | III. Oc. Re. | 26 | 10 | 17 | | III. *Tr. In. | | | | | |
| | 3 | 18 | | III. Sh. In. | | 21 | 26 | 21.0 | III. Ec. Dis. | | 13 | 44 | | III. Tr. Eg. | | | | | |
| | 6 | 33 | | III. *Sh. Eg. | 16 | 0 | 28 | 51.6 | III. Ec. Re. | | 15 | 27 | | III. Sh. In. | | | | | |
| | 11 | 11 | | I. *Tr. In. | | 2 | 6 | | I. Tr. In. | | 17 | 4 | | I. Tr. In. | | | | | |
| | 12 | 32 | | I. Sh. In. | | 3 | 26 | | I. Sh. In. | | 18 | 20 | | I. Sh. In. | | | | | |
| | 13 | 30 | | I. Tr. Eg. | | 4 | 25 | | I. Tr. Eg. | | 18 | 38 | | III. Sh. Eg. | | | | | |
| | 14 | 50 | | I. Sh. Eg. | | 5 | 43 | | I. *Sh. Eg. | | 19 | 23 | | I. Tr. Eg. | | | | | |
| | 21 | 9 | | II. Tr. In. | | 13 | 9 | | II. Tr. In. | 27 | 20 | 37 | | I. Sh. Eg. | | | | | |
| | 23 | 54 | | II. Sh. In. | | 15 | 50 | | II. Sh. In. | | 5 | 13 | | II. *Tr. In. | | | | | |
| 6 | 0 | 2 | | II. Tr. Eg. | | 16 | 2 | | II. Tr. Eg. | | 7 | 46 | | II. *Sh. In. | | | | | |
| | 2 | 44 | | II. Sh. Eg. | | 18 | 39 | | II. Sh. Eg. | | 8 | 6 | | II. *Tr. Eg. | | | | | |
| | 8 | 32 | | I. *Oc. Dis. | | 23 | 27 | | I. Oc. Dis. | | 10 | 35 | | II. *Sh. Eg. | | | | | |
| | 12 | 8 | 0.1 | I. Ec. Re. | 17 | 3 | 1 | 19.4 | I. Ec. Re. | | 14 | 25 | | I. Oc. Dis. | | | | | |
| 7 | 5 | 40 | | I. *Tr. In. | | 20 | 36 | | I. Tr. In. | | 17 | 54 | 34.4 | I. Ec. Re. | | | | | |
| | 7 | 1 | | I. *Sh. In. | | 21 | 55 | | I. Sh. In. | 28 | 11 | 34 | | I. Tr. In. | | | | | |
| | 7 | 59 | | I. *Tr. Eg. | | 22 | 55 | | I. Tr. Eg. | | 12 | 48 | | I. Sh. In. | | | | | |
| | 9 | 19 | | I. *Sh. Eg. | 18 | 0 | 12 | | I. Sh. Eg. | | 13 | 53 | | I. Tr. Eg. | | | | | |
| | 15 | 18 | | II. Oc. Dis. | | 7 | 19 | | II. *Oc. Dis. | | 15 | 5 | | I. Sh. Eg. | | | | | |
| | 20 | 49 | 3.0 | II. Ec. Re. | | 12 | 45 | 23.5 | II. Ec. Re. | | 21 | 27 | | IV. Tr. In. | | | | | |
| 8 | 3 | 1 | | I. Oc. Dis. | | 17 | 57 | | I. Oc. Dis. | | 23 | 26 | | II. Oc. Dis. | | | | | |
| | 6 | 36 | 51.4 | I. *Ec. Re. | | 21 | 30 | 10.6 | I. Ec. Re. | 29 | 1 | 33 | | IV. Tr. Eg. | | | | | |
| | 11 | 45 | | III. Oc. Dis. | 19 | 6 | 2 | | III. *Tr. In. | | 4 | 42 | 36.4 | II. Ec. Re. | | | | | |
| | 15 | 13 | | III. Oc. Re. | | 9 | 30 | | III. *Tr. Eg. | | 8 | 55 | | I. *Oc. Dis. | | | | | |
| | 17 | 23 | 8.2 | III. Ec. Dis. | | 11 | 23 | | III. Sh. In. | | 9 | 25 | | IV. *Sh. In. | | | | | |
| | 20 | 26 | 45.0 | III. Ec. Re. | | 14 | 36 | | III. Sh. Eg. | | 12 | 23 | 23.9 | I. Ec. Re. | | | | | |
| 9 | 0 | 9 | | I. Tr. In. | | 15 | 5 | | I. Tr. In. | | 12 | 33 | | IV. Sh. Eg. | | | | | |
| | 1 | 30 | | I. Sh. In. | | 16 | 24 | | I. Sh. In. | 30 | 0 | 24 | | III. Oc. Dis. | | | | | |
| | 2 | 28 | | I. Tr. Eg. | | 17 | 24 | | I. Tr. Eg. | | 3 | 50 | | III. Oc. Re. | | | | | |
| | 3 | 47 | | I. Sh. Eg. | | 18 | 41 | | I. Sh. Eg. | | 5 | 31 | 24.0 | III. *Ec. Dis. | | | | | |
| | 10 | 28 | | II. *Tr. In. | 20 | 2 | 30 | | II. Tr. In. | | 6 | 4 | | I. *Tr. In. | | | | | |
| | 13 | 12 | | II. Sh. In. | | 5 | 9 | | II. *Sh. In. | | 7 | 17 | | I. *Sh. In. | | | | | |
| | 13 | 21 | | II. Tr. Eg. | | 5 | 23 | | II. *Tr. Eg. | | 8 | 23 | | I. *Tr. Eg. | | | | | |
| | 16 | 2 | | II. Sh. Eg. | | 7 | 58 | | II. *Sh. Eg. | | 8 | 31 | 38.4 | III. *Ec. Re. | | | | | |
| | 21 | 30 | | I. Oc. Dis. | | 9 | 55 | | IV. *Oc. Dis. | | 9 | 34 | | I. *Sh. Eg. | | | | | |
| 10 | 1 | 5 | 46.2 | I. Ec. Re. | | 12 | 26 | | I. Oc. Dis. | | 18 | 35 | | II. Tr. In. | | | | | |
| | 18 | 38 | | I. Tr. In. | | 14 | 3 | | IV. Oc. Re. | | 21 | 4 | | II. Sh. In. | | | | | |
| | 19 | 59 | | I. Sh. In. | | 15 | 59 | 6.2 | I. Ec. Re. | | 21 | 28 | | II. Tr. Eg. | | | | | |
| | 20 | 57 | | I. Tr. Eg. | | 22 | 38 | 31.9 | IV. Ec. Dis. | | 23 | 53 | | II. Sh. Eg. | | | | | |
| | 22 | 16 | | I. Sh. Eg. | 21 | 1 | 34 | 0.1 | IV. Ec. Re. | 31 | 3 | 24 | | I. Oc. Dis. | | | | | |
| 11 | 4 | 38 | | II. Oc. Dis. | | 9 | 35 | | I. *Tr. In. | | 6 | 52 | 15.9 | I. *Ec. Re. | | | | | |
| | 10 | 7 | 38.3 | II. *Ec. Re. | | | | | | | | | | | | | | | |

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

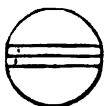
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

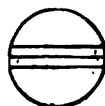
DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

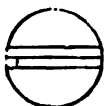
I.

r
*

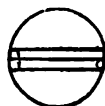
III.

d
* r
*

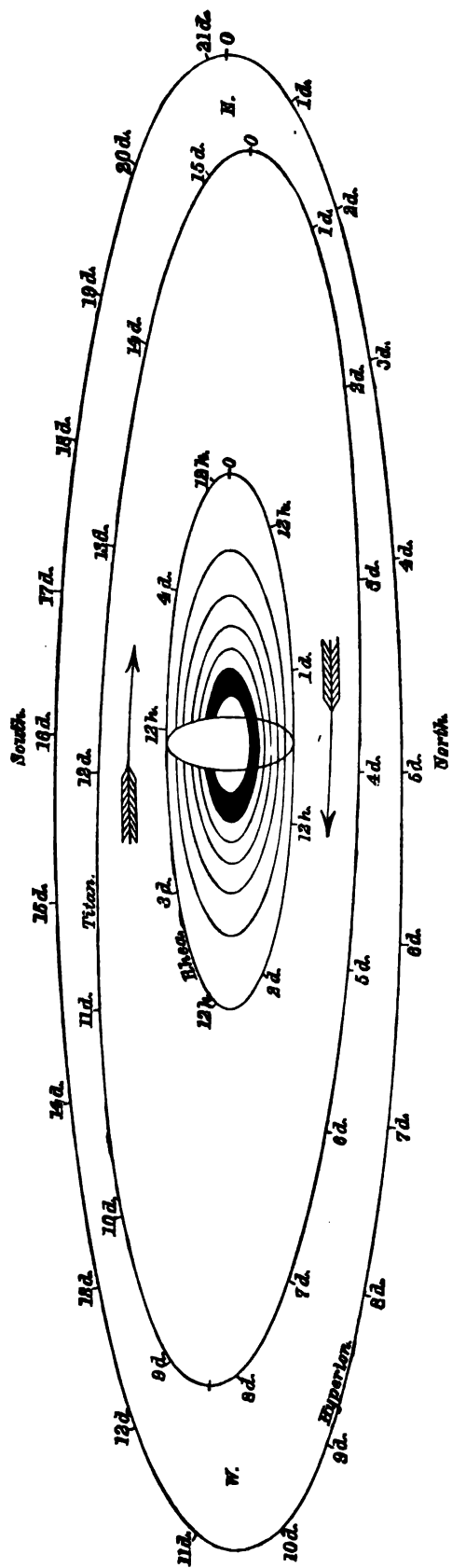
II.

r
*

IV.

d
* r
**Configurations at 6^h 30^m for an Inverting Telescope.*

| Day. | West. | | | | East. | | | |
|------|-------|---|---|---|-------|---|---|---|
| 1 | | 4 | | 3 | 1 | 2 | | |
| 2 | 2 | | 4 | 1 | | 3 | | |
| 3 | | | 2 | 4 | 1 | | 3 | |
| 4 | | | | 1 | 2 | 4 | 3 | |
| 5 | | | | 3 | 1 | 2 | | 4 |
| 6 | | 3 | | 2 | 1 | | | 4 |
| 7 | 1 | | 3 | 2 | | | | 4 |
| 8 | | | | 3 | 1 | 2 | | 4 |
| 9 | | | | 1 | 2 | 3 | | 4 |
| 10 | | | 2 | | 1 | | 3 | 4 |
| 11 | | | | 1 | | 4 | 3 | 2 |
| 12 | | | | 3 | 1 | 2 | | |
| 13 | | | 3 | 4 | | | | |
| 14 | | 4 | 3 | 2 | 1 | | | |
| 15 | | 4 | | 3 | | 2 | | 1 |
| 16 | | 4 | | 1 | 2 | 3 | | |
| 17 | | 4 | | 2 | 1 | | 3 | |
| 18 | | 4 | | 1 | 2 | | 3 | |
| 19 | 3 | | 4 | | 1 | 2 | | |
| 20 | | | 3 | 1 | | 4 | | |
| 21 | | | 3 | 2 | 1 | | 4 | |
| 22 | | | | 3 | 1 | 2 | | 4 |
| 23 | 1 | | | | | 3 | | 4 |
| 24 | | | 2 | | 1 | | 3 | 4 |
| 25 | | | | 1 | 2 | | 3 | 4 |
| 26 | | | | | 3 | 1 | 2 | 4 |
| 27 | 2 | | 3 | 1 | | | 4 | |
| 28 | | | 3 | 2 | 1 | 4 | | |
| 29 | | | | 3 | 4 | 1 | 2 | |
| 30 | 1 | | 4 | | 3 | 2 | | |
| 31 | | 4 | | 2 | 1 | | 3 | |



EPH 91—30—10

| Names of the Satellites. |
|-----------------------------|
| I. Mimas. |
| II. Enceladus. |
| III. Tethys. |
| IV. Dione. |
| V. Rhea. |
| VI. Titan. |
| VII. Hyperion. |
| VIII. Iapetus. |

| Mean Synodic Periods. |
|--------------------------|
| d h |
| I. 0 22.6 |
| II. 1 8.9 |
| III. 1 31.3 |
| IV. 2 17.7 |
| V. 4 12.5 |
| VI. 15 23.3 |
| VII. 21 7.8 |
| VIII. 79 22.0 |

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

MAY 17, 1891,

AS SEEN IN AN INVERTING TELESCOPE.

(THE VERTICAL SCALE IS TWICE THE HORIZONTAL ONE.)

WASHINGTON MEAN TIMES OF GREATEST ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "o" are those of the eastern elongation, as seen in an inverting telescope. The apparent positions of a satellite at any time may be marked on the diagram by counting around the orbit the interval in days and hours which has elapsed since the last east elongation. The times of these elongations may be found from the following tables. Mimas can be seen only within a few hours of each elongation: the time of every elongation visible at Washington is therefore given. The times of other elongations of any satellite in the same direction may be found by adding or subtracting any multiple of the period. For the three outer satellites the times of elongation and conjunction are given. The following abbreviations are used:—

E., East Elongation,
I., Inferior Conjunction,
W., West Elongation,
S., Superior Conjunction.

MIMAS.

Greatest Elongations Visible at Washington.

| | | | | | |
|----------------|-----------------|----------------|-----------------|-----------------|-----------------|
| Jan. 1 15.3 W. | Jan. 29 10.5 E. | Mar. 1 12.9 E. | Mar. 27 10.9 W. | Apr. 28 11.9 W. | Nov. 24 16.5 W. |
| 2 13.9 W. | 30 9.1 E. | 2 11.5 E. | 28 9.5 W. | 29 10.6 W. | 25 15.1 W. |
| 3 12.5 W. | Feb. 3 14.9 W. | 3 10.1 E. | 29 8.1 W. | 30 9.2 W. | Dec. 1 18.1 E. |
| 4 11.1 W. | 4 13.5 W. | 4 8.8 E. | Apr. 1 15.3 E. | May 6 12.2 E. | 2 16.8 E. |
| 8 16.9 E. | 5 12.1 W. | 8 14.5 W. | 2 13.9 E. | 7 10.8 E. | 3 15.4 E. |
| 9 15.5 E. | 6 10.8 W. | 9 13.2 W. | 3 12.5 E. | 8 9.4 E. | 4 14.0 E. |
| 10 14.1 E. | 11 15.2 E. | 10 11.8 W. | 4 11.2 E. | 9 8.0 E. | 10 17.0 W. |
| 11 12.8 E. | 12 13.8 E. | 11 10.4 W. | 5 9.8 E. | 15 11.1 W. | 11 15.6 W. |
| 12 11.4 E. | 13 12.4 E. | 12 9.0 W. | 9 15.6 W. | 16 9.7 W. | 12 14.3 W. |
| 13 10.0 E. | 14 11.0 E. | 13 7.6 W. | 10 14.2 W. | 17 8.3 W. | 13 12.8 W. |
| 16 17.2 W. | 15 9.6 E. | 16 14.8 E. | 11 12.8 W. | 24 9.9 E. | 18 17.3 E. |
| 17 15.8 W. | 16 8.3 E. | 17 13.4 E. | 12 11.4 W. | 25 8.6 E. | 19 15.9 E. |
| 18 14.4 W. | 20 14.0 W. | 18 12.0 E. | 13 10.0 W. | June 1 10.2 W. | 20 14.5 E. |
| 19 13.0 W. | 21 12.6 W. | 19 10.7 E. | 14 8.7 W. | 2 8.8 W. | 21 13.1 E. |
| 20 11.6 W. | 22 11.3 W. | 20 9.3 E. | 18 14.5 E. | 9 10.5 E. | 25 17.5 W. |
| 21 10.2 W. | 23 9.9 W. | 21 7.9 E. | 19 13.1 E. | 10 9.1 E. | 26 16.1 W. |
| 26 14.6 E. | 24 8.5 W. | 24 15.1 W. | 20 11.7 E. | Nov. 17 14.9 E. | 27 14.8 W. |
| 27 13.3 E. | 27 15.7 E. | 25 13.7 W. | 21 10.3 E. | 18 13.5 E. | 28 13.4 W. |
| 28 11.9 E. | 28 14.3 E. | 26 12.3 W. | 27 13.3 W. | 23 17.9 W. | 29 12.0 W. |

ENCELADUS.

| | | | | | |
|---------------|----------------|-----------------|-----------------|----------------|-----------------|
| Jan. 1 7.7 E. | Jan. 15 0.5 E. | Jan. 28 17.3 E. | Feb. 11 10.2 E. | Feb. 25 3.1 E. | Mar. 10 19.9 E. |
| 2 16.5 E. | 16 9.4 E. | 30 2.2 E. | 12 19.1 E. | 26 11.9 E. | 12 4.8 E. |
| 4 1.4 E. | 17 18.3 E. | 31 11.1 E. | 14 4.0 E. | 27 20.8 E. | 13 13.7 E. |
| 5 10.3 E. | 19 3.2 E. | Feb. 1 20.0 E. | 15 12.9 E. | Mar. 1 5.7 E. | 14 22.6 E. |
| 6 19.2 E. | 20 12.0 E. | 3 4.9 E. | 16 21.8 E. | 2 14.6 E. | 16 7.5 E. |
| 8 4.1 E. | 21 20.9 E. | 4 13.8 E. | 18 6.7 E. | 3 23.5 E. | 17 16.3 E. |
| 9 12.9 E. | 23 5.8 E. | 5 22.7 E. | 19 15.5 E. | 5 8.4 E. | 19 1.2 E. |
| 10 21.8 E. | 24 14.7 E. | 7 7.6 E. | 21 0.4 E. | 6 17.3 E. | 20 10.1 E. |
| 12 6.7 E. | 25 23.6 E. | 8 16.4 E. | 22 9.3 E. | 8 2.1 E. | 21 19.0 E. |
| 13 15.6 E. | 27 8.4 E. | 10 1.3 E. | 23 18.2 E. | 9 11.0 E. | 23 3.9 E. |

WASHINGTON MEAN TIMES OF GREATEST ELONGATION.

ENCELADUS—(Concluded.)

| | | | | | |
|-----------------|----------------|---------------|----------------|----------------|-----------------|
| Mar. 24 12.8 E. | Apr. 14 2.0 E. | May 4 15.3 E. | Nov. 1 13.1 E. | Nov. 22 2.4 E. | Dec. 12 15.6 E. |
| 25 21.6 E. | 15 10.9 E. | 6 0.2 E. | 2 22.0 E. | 23 11.3 E. | 14 0.5 E. |
| 27 6.5 E. | 16 19.8 E. | 7 9.1 E. | 4 6.8 E. | 24 20.1 E. | 15 9.4 E. |
| 28 15.4 E. | 18 4.7 E. | 8 18.0 E. | 5 15.7 E. | 26 5.0 E. | 16 18.3 E. |
| 30 0.3 E. | 19 13.6 E. | 10 2.8 E. | 7 0.6 E. | 27 13.9 E. | 18 3.2 E. |
| 31 9.2 E. | 20 22.5 E. | 11 11.7 E. | 8 9.5 E. | 28 22.8 E. | 19 12.1 E. |
| Apr. 1 18.1 E. | 22 7.4 E. | 12 20.6 E. | 9 18.4 E. | 30 7.7 E. | 20 21.0 E. |
| 3 3.0 E. | 23 16.2 E. | 14 5.5 E. | 11 3.3 E. | Dec. 1 16.6 E. | 22 5.8 E. |
| 4 11.8 E. | 25 1.1 E. | 15 14.4 E. | 12 12.2 E. | 3 1.4 E. | 23 14.7 E. |
| 5 20.7 E. | 26 10.0 E. | 16 23.3 E. | 13 21.0 E. | 4 10.3 E. | 24 23.6 E. |
| 7 5.6 E. | 27 18.9 E. | 18 8.1 E. | 15 5.9 E. | 5 19.2 E. | 26 8.5 E. |
| 8 14.5 E. | 29 3.8 E. | 19 17.0 E. | 16 14.8 E. | 7 4.1 E. | 27 17.4 E. |
| 9 23.4 E. | 30 12.7 E. | 21 1.9 E. | 17 23.7 E. | 8 13.0 E. | 29 2.3 E. |
| 11 8.3 E. | May 1 21.5 E. | 22 10.8 E. | 19 8.6 E. | 9 21.9 E. | 30 11.1 E. |
| 12 17.2 E. | 3 6.4 E. | 23 19.7 E. | 20 17.5 E. | 11 6.8 E. | 31 20.0 E. |

TETHYS.

| | | | | | |
|----------------|---------------|----------------|-----------------|-----------------|----------------|
| Jan. 1 12.7 E. | Feb. 8 6.6 E. | Mar. 18 0.5 E. | Apr. 24 18.5 E. | June 1 12.4 E. | Nov. 26 1.4 E. |
| 3 9.9 E. | 10 3.9 E. | 19 21.8 E. | 26 15.8 E. | 3 9.7 E. | 27 22.7 E. |
| 5 7.2 E. | 12 1.2 E. | 21 19.1 E. | 28 13.1 E. | 5 7.0 E. | 29 20.0 E. |
| 7 4.5 E. | 13 22.5 E. | 23 16.4 E. | 30 10.4 E. | 7 4.3 E. | Dec. 1 17.3 E. |
| 9 1.8 E. | 15 19.8 E. | 25 13.7 E. | May 2 7.7 E. | 9 1.6 E. | 3 14.6 E. |
| 10 23.1 E. | 17 17.1 E. | 27 11.0 E. | 4 5.0 E. | 10 22.9 E. | 5 11.9 E. |
| 12 20.5 E. | 19 14.4 E. | 29 8.3 E. | 6 2.3 E. | 12 20.2 E. | 7 9.2 E. |
| 14 17.7 E. | 21 11.7 E. | 31 5.6 E. | 7 23.6 E. | 14 17.5 E. | 9 6.5 E. |
| 16 15.0 E. | 23 8.9 E. | Apr. 2 2.9 E. | 9 20.9 E. | 16 14.8 E. | 11 3.8 E. |
| 18 12.3 E. | 25 6.3 E. | 4 0.2 E. | 11 18.2 E. | 18 12.1 E. | 13 1.1 E. |
| 20 9.6 E. | 27 3.6 E. | 5 21.5 E. | 13 15.4 E. | 20 9.4 E. | 14 22.4 E. |
| 22 6.9 E. | Mar. 1 0.9 E. | 7 18.8 E. | 15 12.7 E. | 22 6.7 E. | 16 19.7 E. |
| 24 4.2 E. | 2 22.2 E. | 9 16.1 E. | 17 10.0 E. | Nov. 10 22.9 E. | 18 17.0 E. |
| 26 1.5 E. | 4 19.5 E. | 11 13.4 E. | 19 7.3 E. | 12 20.2 E. | 20 14.3 E. |
| 27 22.8 E. | 6 16.8 E. | 13 10.7 E. | 21 4.6 E. | 14 17.5 E. | 22 11.6 E. |
| 29 20.1 E. | 8 14.1 E. | 15 8.0 E. | 23 1.9 E. | 16 14.8 E. | 24 8.9 E. |
| 31 17.4 E. | 10 11.4 E. | 17 5.3 E. | 24 23.2 E. | 18 12.1 E. | 26 6.3 E. |
| Feb. 2 14.7 E. | 12 8.7 E. | 19 2.6 E. | 26 20.5 E. | 20 9.4 E. | 28 3.6 E. |
| 4 12.0 E. | 14 5.9 E. | 20 23.9 E. | 28 17.8 E. | 22 6.7 E. | 30 0.9 E. |
| 6 9.3 E. | 16 3.2 E. | 22 21.2 E. | 30 15.1 E. | 24 4.1 E. | 31 22.2 E. |

DIONE.

| | | | | | |
|---------------|----------------|----------------|-----------------|-----------------|----------------|
| Jan. 3 1.0 E. | Feb. 4 20.9 E. | Mar. 9 16.9 E. | Apr. 11 12.8 E. | May 14 8.7 E. | Nov. 30 6.8 E. |
| 5 18.7 E. | 7 14.6 E. | 12 10.5 E. | 14 6.4 E. | 17 2.3 E. | Dec. 3 0.5 E. |
| 8 12.4 E. | 10 8.3 E. | 15 4.2 E. | 17 0.1 E. | 19 20.0 E. | 5 18.1 E. |
| 11 6.0 E. | 13 1.9 E. | 17 21.8 E. | 19 17.7 E. | 22 13.7 E. | 8 11.8 E. |
| 13 23.7 E. | 15 19.6 E. | 20 15.5 E. | 22 11.4 E. | 25 7.3 E. | 11 5.5 E. |
| 16 17.3 E. | 18 13.2 E. | 23 9.1 E. | 25 5.1 E. | 28 1.0 E. | 13 23.2 E. |
| 19 11.0 E. | 21 6.9 E. | 26 2.8 E. | 27 22.7 E. | 30 18.6 E. | 16 16.8 E. |
| 22 4.6 E. | 24 0.6 E. | 28 20.5 E. | 30 16.4 E. | Nov. 16 14.6 E. | 19 10.5 E. |
| 24 22.3 E. | 26 18.2 E. | 31 14.1 E. | May 3 10.0 E. | 19 8.1 E. | 22 4.2 E. |
| 27 16.0 E. | Mar. 1 11.9 E. | Apr. 3 7.8 E. | 6 3.7 E. | 22 1.8 E. | 24 21.9 E. |
| 30 9.6 E. | 4 5.5 E. | 6 1.4 E. | 8 21.4 E. | 24 19.5 E. | 27 15.5 E. |
| Feb. 2 3.3 E. | 6 23.2 E. | 8 19.1 E. | 11 15.0 E. | 27 13.1 E. | 30 9.2 E. |

SATELLITES AND RINGS OF SATURN, 1891. 477

| RHEA. | | | | TITAN. | | | | HYPERION. | | | |
|-------|----|------|----|--------|---------|------|----|-----------|--------|------|----|
| Jan. | d | h | | Apr. | d | h | | Jan. | d | h | |
| | 4 | 13.8 | E. | | 22 | 22.4 | E. | | 4 | 17.8 | W. |
| | 9 | 2.2 | E. | | 27 | 10.8 | E. | | 10 | 4.6 | S. |
| | 13 | 14.5 | E. | | May 1 | 23.2 | E. | | 14 | 14.9 | E. |
| | 18 | 2.9 | E. | | 6 | 11.5 | E. | | 19 | 16.4 | I. |
| | 22 | 15.2 | E. | | 10 | 23.9 | E. | | 25 | 23.7 | W. |
| | 27 | 3.6 | E. | | 15 | 12.3 | E. | | 31 | 10.1 | S. |
| | 31 | 16.0 | E. | | 20 | 0.7 | E. | | Feb. 4 | 20.2 | E. |
| Feb. | 5 | 4.3 | E. | | 24 | 13.0 | E. | | 9 | 21.4 | I. |
| | 9 | 16.7 | E. | | 29 | 1.4 | E. | | 16 | 4.6 | W. |
| | 14 | 5.0 | E. | | June 2 | 13.7 | E. | | 21 | 14.8 | S. |
| | 18 | 17.4 | E. | | 7 | 2.1 | E. | | 26 | 0.8 | E. |
| | 23 | 5.8 | E. | | 11 | 14.5 | E. | | Mar. 3 | 2.0 | I. |
| | 27 | 18.1 | E. | | 16 | 2.8 | E. | | 9 | 9.1 | W. |
| Mar. | 4 | 6.5 | E. | | 20 | 15.2 | E. | | 14 | 19.3 | S. |
| | 8 | 18.8 | E. | | Nov. 16 | 21.0 | E. | | 19 | 5.3 | E. |
| | 13 | 7.2 | E. | | 21 | 9.6 | E. | | 24 | 6.4 | I. |
| | 17 | 19.6 | E. | | 25 | 22.2 | E. | | 30 | 13.5 | W. |
| | 22 | 7.9 | E. | | 30 | 10.8 | E. | | Apr. 5 | 0.0 | S. |
| | 26 | 20.3 | E. | | Dec. 4 | 23.4 | E. | | 10 | 1.1 | E. |
| | 31 | 8.6 | E. | | 9 | 12.0 | E. | | 14 | 11.4 | I. |
| Apr. | 4 | 21.0 | E. | | 14 | 0.6 | E. | | 20 | 18.4 | W. |
| | 9 | 9.4 | E. | | 18 | 13.2 | E. | | 26 | 5.4 | S. |
| | 13 | 21.7 | E. | | 23 | 1.8 | E. | | 30 | 15.6 | E. |
| | 18 | 10.1 | E. | | 27 | 14.4 | E. | | May 5 | 17.3 | I. |

IAPETUS.

| Jan. | d | h | | Mar. | d | h | | May | d | h | | July | d | h | | Oct. | d | h | | Dec. | d | h | |
|------|----|-----|----|------|--------|------|----|-----|--------|------|----|------|--------|------|----|------|---------|------|----|------|----|------|----|
| | 16 | 0.0 | I. | | 16 | 19.9 | E. | | 13 | 20.6 | S. | | 12 | 12.9 | W. | | 22 | 15.2 | S. | | 21 | 17.5 | W. |
| Feb. | 4 | 9.6 | W. | | Apr. 4 | 18.0 | I. | | June 3 | 18.6 | E. | | Aug. 2 | 6.0 | S. | | Nov. 12 | 15.4 | E. | | | | |
| | 24 | 9.2 | S. | | 23 | 15.5 | W. | | 23 | 3.0 | I. | | Oct. 1 | 21.0 | W. | | Dec. 2 | 9.5 | I. | | | | |

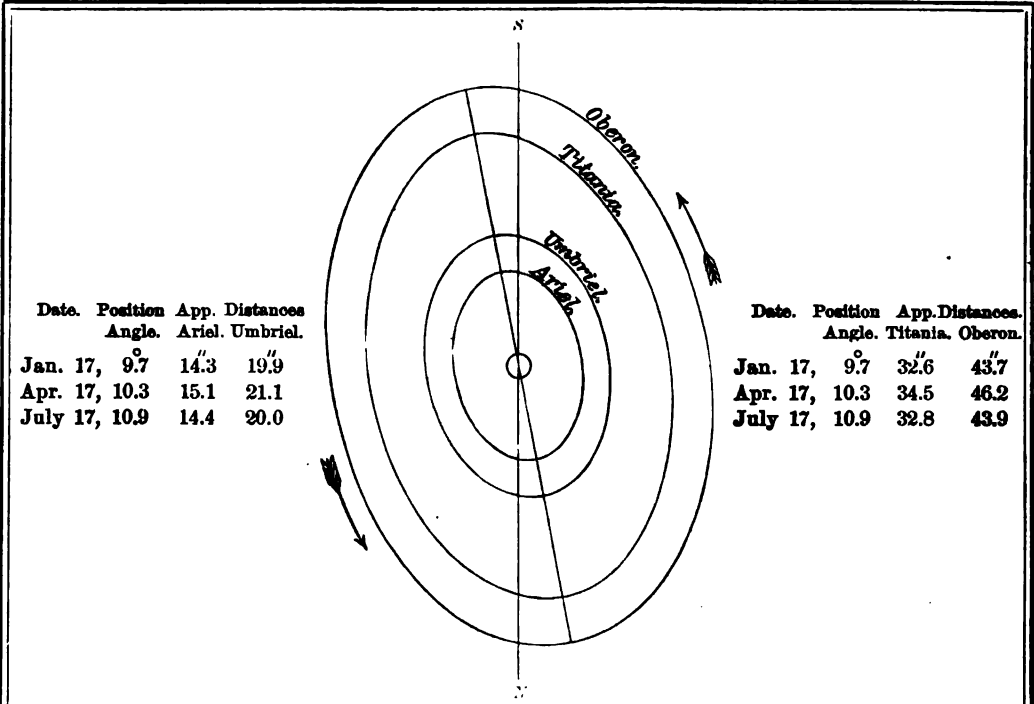
THE APPARENT ELEMENTS OF SATURN'S RINGS.

| Greenwich Mean Noon. | a | b | p Inclination of Northern Semi-Minor Axis to Circle of Declination from North to East. | l The Elevation of the Earth above the Plane of the Ring. | l' The Elevation of the Sun above the Plane of the Ring. | u Earth's Longitude from Saturn counted on Plane of Ring from the Ring's As- cending Node on | |
|----------------------------|-------|------|---|--|---|--|-----------|
| | | | | | | Equator. | Ecliptic. |
| Jan. 0 | 42.07 | 1.58 | — 5 10.7 | — 2 9.0 | — 4 42.2 | 222 39.7 | 180 8.0 |
| 20 | 43.40 | 1.86 | — 5 12.9 | — 2 27.7 | — 4 23.6 | 222 15.3 | 179 44.7 |
| Feb. 9 | 44.39 | 2.36 | — 5 18.0 | — 3 3.2 | — 4 4.9 | 221 17.9 | 178 47.4 |
| Mar. 1 | 44.82 | 2.97 | — 5 24.8 | — 3 48.2 | — 3 46.3 | 219 59.1 | 177 28.7 |
| 21 | 44.58 | 3.54 | — 5 31.8 | — 4 33.1 | — 3 27.7 | 218 36.4 | 176 6.1 |
| Apr. 10 | 43.76 | 3.93 | — 5 38.0 | — 5 9.0 | — 3 9.1 | 217 20.5 | 174 50.3 |
| 30 | 42.51 | 4.05 | — 5 41.5 | — 5 28.2 | — 2 50.5 | 216 37.3 | 174 7.1 |
| May 20 | 41.07 | 3.90 | — 5 41.2 | — 5 26.4 | — 2 31.8 | 216 40.9 | 174 10.8 |
| June 9 | 39.63 | 3.53 | — 5 38.6 | — 5 6.8 | — 2 13.2 | 217 11.4 | 174 41.4 |
| 29 | 38.34 | 3.00 | — 5 33.3 | — 4 29.7 | — 1 54.6 | 218 15.2 | 175 45.3 |
| July 19 | 37.29 | 2.37 | — 5 25.6 | — 3 38.5 | — 1 35.9 | 219 46.3 | 177 16.4 |
| Aug. 8 | 36.54 | 1.67 | — 5 16.0 | — 2 37.2 | — 1 17.3 | 221 38.0 | 179 8.3 |
| 28 | 36.10 | 0.94 | — 5 4.9 | — 1 29.5 | — 0 58.8 | 223 43.4 | 181 13.7 |
| Sept. 17 | 36.00 | 0.20 | — 4 52.9 | — 0 19.6 | — 0 40.2 | 225 55.3 | 183 25.7 |
| Oct. 7 | 36.23 | 0.51 | — 4 40.8 | + 0 48.4 | — 0 21.7 | 228 6.2 | 185 36.7 |
| 27 | 36.80 | 1.18 | — 4 29.2 | + 1 50.2 | — 0 3.2 | 230 8.3 | 187 38.9 |
| Nov. 16 | 37.70 | 1.77 | — 4 18.9 | + 2 41.6 | + 0 15.3 | 231 53.7 | 189 24.3 |
| Dec. 6 | 38.87 | 2.24 | — 4 11.0 | + 3 18.4 | + 0 33.8 | 233 14.1 | 190 44.8 |
| 26 | 40.25 | 2.54 | — 4 6.3 | + 3 37.4 | + 0 52.3 | 234 2.2 | 191 33.0 |
| 31 | 40.61 | 2.58 | — 4 5.6 | + 3 39.1 | + 0 56.9 | 234 8.4 | 191 39.3 |

The factor to be multiplied by *a* and *b* to obtain the axes of—

| | | |
|-------------------------------------|----------|---------------------|
| The inner ellipse of the outer ring | = 0.8801 | log factor = 9.9445 |
| The outer ellipse of the inner ring | = 0.8599 | log factor = 9.9344 |
| The inner ellipse of the inner ring | = 0.6650 | log factor = 9.8228 |
| The inner ellipse of the dusky ring | = 0.5486 | log factor = 9.7392 |

NOTE.—The negative sign of *l* indicates that the visible surface of the ring is the southern one.

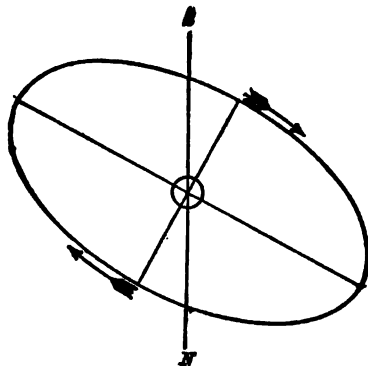


APPARENT ORBITS OF THE SATELLITES OF URANUS IN 1891, AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

| ARIEL. | | UMBRIEL. | | TITANIA. | | OBERON. |
|--------------------|-------------|--------------|--------------------|--------------|-------------|------------------|
| North. | South. | North. | South. | North. | South. | North and South. |
| d h | d h | d h | d h | d h | d h | d h |
| Jan. 19 8.4 | Jan. 23 3.1 | Jan. 17 15.2 | Jan. 19 16.9 | Jan. 12 16.8 | Jan. 17 1.3 | Jan. 18 3.3 N. |
| 26 21.9 | 30 16.6 | 25 22.1 | 27 3.8 | 21 9.8 | 25 18.2 | 24 20.9 S. |
| Feb. 3 11.3 | Feb. 7 6.1 | Feb. 3 5.0 | Feb. 5 6.8 | 30 2.7 | Feb. 3 11.2 | 31 14.5 N. |
| 11 0.8 | 14 19.5 | 11 11.9 | 13 13.7 | Feb. 7 19.7 | 12 4.1 | Feb. 7 8.0 S. |
| 18 14.2 | 22 9.0 | 19 18.9 | 21 20.6 | 16 12.6 | 20 21.1 | 14 1.6 N. |
| 26 3.7 | Mar. 1 22.4 | 28 1.8 | Mar. 2 3.5 | 25 5.6 | Mar. 1 14.0 | 20 19.2 S. |
| Mar. 5 17.2 | 9 11.9 | Mar. 8 8.7 | 10 10.4 | Mar. 5 22.5 | 10 7.0 | 27 12.8 N. |
| 13 6.6 | 17 1.3 | 16 15.7 | 18 17.4 | 14 15.5 | 18 23.9 | Mar. 6 6.3 S. |
| 20 20.1 | 24 14.8 | 24 22.6 | 27 0.2 | 23 8.4 | 27 16.9 | 12 23.9 N. |
| 28 9.5 | Apr. 1 4.3 | Apr. 2 5.5 | Apr. 4 7.2 | Apr. 1 1.4 | Apr. 5 9.8 | 19 17.5 S. |
| Apr. 4 23.0 | 8 17.7 | 10 12.4 | 12 14.1 | 9 18.4 | 14 2.8 | 26 11.1 N. |
| 12 12.4 | 16 7.2 | 18 19.4 | 20 21.1 | 18 11.4 | 22 19.9 | Apr. 2 4.7 S. |
| 20 1.9 | 23 20.6 | 27 2.3 | 29 4.0 | 27 4.4 | May 1 12.8 | 8 22.3 N. |
| 27 15.4 | May 1 10.1 | May 5 9.2 | May 7 10.9 | May 5 21.3 | 10 5.8 | 15 15.8 S. |
| May 5 4.8 | 8 23.5 | 13 16.2 | 15 17.9 | 14 14.3 | 18 22.7 | 22 9.5 N. |
| 12 18.3 | 16 13.0 | 21 23.1 | 24 0.8 | 23 7.2 | 27 15.7 | 29 3.0 S. |
| 20 7.7 | 24 2.5 | 30 6.1 | June 1 7.7 | June 1 0.1 | June 5 8.6 | May 5 20.7 N. |
| 27 21.2 | 31 15.9 | June 7 13.0 | 9 14.7 | 9 17.1 | 14 1.5 | 12 14.2 S. |
| June 4 10.7 | June 8 5.4 | 15 19.9 | 17 21.6 | 18 10.0 | 22 18.5 | 19 7.9 N. |
| 12 0.1 | 15 18.8 | 24 2.9 | 26 4.5 | 27 3.0 | July 1 11.4 | 26 1.4 S. |
| 19 13.6 | 23 8.3 | July 2 9.8 | July 4 11.4 | July 5 19.9 | 10 4.4 | June 1 19.1 N. |
| 27 3.0 | 30 21.7 | 10 16.7 | 12 18.4 | 14 12.8 | 18 21.3 | 8 12.5 S. |
| July 4 16.5 | July 8 11.2 | 18 23.6 | 21 1.3 | 23 5.8 | 27 14.2 | 15 6.3 N. |
| 12 6.0 | 16 0.7 | 27 6.6 | 29 8.2 | 31 22.7 | Aug. 5 7.2 | 21 23.7 S. |
| 19 19.4 | 23 14.1 | Aug. 4 13.5 | Aug. 6 15.1 | Aug. 9 15.7 | 14 0.1 | 28 17.5 N. |
| Period of Ariel, | | d h | Period of Titania, | | d h | |
| Period of Umbriel, | | 2 12.489 | Period of Oberon, | | 13 11.119 | |

NOTE.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.



| Date. | Position Angle. | Apparent Distance. |
|----------|--------------------|-----------------------|
| Jan. 10, | 239.6 | 16.8 |
| Nov. 24, | 942.9 | 17.0 |

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE IN 1891,
AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

| North East. | South West. | North East. | South West. | North East. | South West. |
|---|--|---|---|---|---|
| Jan. d h 1 23.7 7 20.8 13 17.8 19 14.8 25 11.9 | Jan. d h 4 22.3 10 19.3 16 16.3 22 13.4 28 10.4 | Aug. d h 30 21.1 Sept. 5 18.2 11 15.2 17 12.3 23 9.3 | Sept. d h 2 19.7 8 16.7 14 13.7 20 10.8 26 7.8 | Nov. d h 3 12.6 9 9.7 15 6.7 21 3.8 27 0.8 | Nov. d h 6 11.1 12 8.2 18 5.2 24 2.3 29 23.3 |
| Feb. d h 31 8.9 6 6.0 12 3.0 18 0.1 23 21.1 | Feb. d h 3 7.5 9 4.5 15 1.6 20 22.6 26 19.6 | Oct. d h 29 6.4 5 3.4 11 0.5 16 21.5 22 18.5 | Oct. d h 2 4.9 8 1.9 13 23.0 19 20.0 25 17.1 | Dec. d h 2 21.9 8 18.9 14 15.9 20 13.0 26 10.0 | Dec. d h 5 20.4 11 17.4 17 14.5 23 11.5 29 8.6 |
| Mar. d h 1 18.2 | Mar. d h 4 16.7 | 28 15.6 | 31 14.1 | Jan. d h 1 7.1 | Jan. d h 4 5.6 |

The above times are those of each passage of the satellite through an apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, remembering that the radius vector of the satellite describes equal areas in equal times.

Period of the satellite of Neptune, 5^d 21^h.045.

In the above diagrams, the central circle represents the planet, and is on the same scale as the orbits.

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

| | d | h | m | | | | d | h | m | | |
|------|----|----|----|-----|--------------------------|---|------|----|----|----|-----------------------------------|
| Jan. | 2 | 8 | 7 | ♂ | in ♍ | ° | Apr. | 7 | 4 | 17 | ♂ ♀ ♀ ♀ + 0 13 |
| | 3 | 15 | 46 | ♂ | Stationary. | | | 9 | 6 | 6 | ♂ ♀ ♀ ♀ + 4 37 |
| | 4 | 2 | 5 | ♂ | ♂ ♂ - 3 20 | | | 10 | 13 | 20 | ♂ ♀ ♀ ♀ + 1 44 |
| | 6 | 22 | - | ♂ | in Perihelion. | | | 11 | 9 | 45 | ♂ ♀ ♀ ♀ - 1 30 |
| | 7 | 1 | 8 | ♂ ♀ | ♂ ♀ + 4 19 | | | 15 | 4 | 48 | ♂ Greatest Hel. Lat. N. |
| | 8 | - | - | ♂ | Greatest brilliancy. | | | 18 | 15 | - | ♂ Greatest elong. E. 20 1 |
| | 8 | 5 | - | ♂ | in Perihelion. | | | 19 | 0 | 25 | ♂ ♀ ♀ - 3 16 |
| | 10 | 7 | 3 | ♂ ♀ | ♂ ♀ + 5 56 | | | 19 | 1 | - | ♂ ♂ |
| | 11 | 15 | 20 | ♂ ♀ | ♂ ♀ + 3 58 | | | 23 | 1 | 18 | ♂ ♂ ♂ - 2 46 |
| | 13 | 0 | 23 | ♂ | Inferior. | | | 27 | 23 | 18 | ♂ ♀ ♂ + 2 17 |
| | 13 | 21 | 28 | ♂ | ♂ ♂ + 4 57 | | | 28 | 21 | 16 | ♂ Stationary. |
| | 17 | 5 | 34 | ♂ | Greatest Hel. Lat. N. | | | 30 | 12 | 15 | ♂ in Aphelion. |
| | 19 | 9 | 23 | ♂ ♀ | ♂ ♀ - 0 48 | | May | 2 | 21 | 49 | ♂ ♀ ♀ + 4 36 |
| | 20 | 22 | - | ♂ | Stationary. | | | 4 | 20 | 33 | ♂ ♀ ♀ + 2 54 |
| | 24 | 7 | - | ♂ | ♂ ♀ - 3 15 | | | 7 | 17 | 5 | ♂ ♀ ♀ + 1 46 |
| | 27 | 16 | 23 | ♂ | Greatest Hel. Lat. N. | | | 8 | 16 | 4 | ♂ in ♍ |
| | 30 | 6 | - | ♂ | Stationary. | | | 8 | 21 | 28 | ♂ ♀ ♀ - 1 40 |
| | 31 | 11 | - | ♂ | ♂ ♂ - 3 4 | | | 9 | 9 | 33 | ♂ Inferior. |
| Feb. | 4 | 2 | - | ♂ | ♂ ♀ + 5 27 | | | 9 | 10 | 37 | ♂ ♂ + 0 1 |
| | 5 | 0 | 26 | ♂ | Greatest elong. W. 25 40 | | | 9 | - | - | ♂ Transit over sun's disk. |
| | 5 | 16 | 40 | ♂ | ♂ ♀ + 3 46 | | | 12 | 16 | 5 | ♂ Stationary. |
| | 6 | 12 | 30 | ♂ | ♂ ♀ + 4 12 | | | 16 | 6 | 57 | ♂ in Aphelion. |
| | 8 | 12 | 24 | ♂ | in ♍ | | | 18 | 21 | 7 | ♂ ♂ - 2 54 |
| | 9 | 16 | 47 | ♂ | ♂ ♂ + 4 38 | | | 20 | 6 | 47 | ♂ Stationary. |
| | 11 | 17 | 38 | ♂ | Stationary. | | | 21 | 16 | - | ♂ eclipsed, invis. at Wash. |
| | 12 | 21 | - | ♂ | ♂ ♂ + 4 38 | | | 23 | - | - | ♂ Greatest Hel. Lat. S. |
| | 12 | 21 | 57 | ♂ | Greatest elong. W. 46 51 | | | 23 | 4 | 24 | ♂ ♂ - 2 54 |
| | 13 | 3 | 32 | ♂ | ♂ ♀ - 0 59 | | | 27 | 11 | - | ♂ ♂ + 4 33 |
| | 15 | 14 | 56 | ♂ | in Aphelion. | | | 30 | 10 | 16 | ♂ ♀ + 0 12 |
| | 19 | 21 | 47 | ♂ | in ♍ | | | 31 | 18 | 3 | ♂ ♀ - 2 23 |
| | 21 | 5 | - | ♂ | ♂ ♂ - 3 4 | | June | 3 | 18 | 6 | ♂ Greatest elong. W. 24 2 |
| | 22 | 5 | - | ♂ | ♂ ♂ - 2 49 | | | 4 | 3 | 31 | ♂ ♀ - 1 44 |
| | 23 | 19 | - | ♂ | ♂ ♀ - 1 26 | | | 4 | 21 | - | ♂ eclipsed, invis. at Wash. |
| Mar. | 27 | 16 | 54 | ♂ | ♂ ♀ + 5 35 | | | 6 | - | - | ♂ ♂ - 1 29 |
| | 3 | 22 | 12 | ♂ | ♂ ♀ + 4 24 | | | 7 | 0 | - | ♂ Greatest Hel. Lat. S. |
| | 4 | 14 | 24 | ♂ | ♂ ♀ + 3 1 | | | 7 | 6 | 28 | ♂ ♀ - 3 30 |
| | 6 | 11 | 18 | ♂ | Greatest Hel. Lat. S. | | | 8 | 6 | 30 | ♂ ♂ - 2 57 |
| | 8 | 9 | 53 | ♂ | ♂ ♂ + 3 25 | | | 12 | 16 | 36 | ♂ ♀ - 0 19 |
| | 8 | 19 | 32 | ♂ | ♂ ♀ - 1 16 | | | 16 | 13 | 49 | ♂ enters ♄, Summer com. |
| | 12 | 7 | 15 | ♂ | enters ♑, Spring com. | | | 17 | 15 | - | ♂ ♀ + 0 29 |
| | 12 | 15 | 13 | ♂ | ♂ ♀ - 3 5 | | | 21 | 0 | 16 | ♂ ♀ + 4 15 |
| | 14 | 23 | 5 | ♂ | ♂ ♂ - 2 41 | | | 22 | 3 | - | ♂ in ♍ |
| | 20 | 4 | 9 | ♂ | ♂ ♂ - 2 41 | | | 26 | 19 | 16 | ♂ in Perihelion. |
| | 22 | 20 | 54 | ♂ | ♂ ♂ - 2 41 | | | 27 | 6 | 28 | ♂ ♀ - 1 52 |
| | 23 | 7 | 50 | ♂ | ♂ ♂ - 2 41 | | July | 1 | 20 | 41 | ♂ in Aphelion. |
| | 26 | 21 | 6 | ♂ | ♂ ♂ - 2 41 | | | 2 | 17 | 5 | ♂ ♀ - 2 7 |
| | 27 | 7 | 36 | ♂ | ♂ ♂ - 2 41 | | | 3 | 10 | - | ♂ ♀ - 1 52 |
| | 31 | 7 | 22 | ♂ | ♂ ♂ - 2 41 | | | 3 | 17 | 54 | ♂ Stationary. |
| Apr. | 4 | 21 | 27 | ♂ | in Perihelion. | | | 5 | 7 | 25 | ♂ ♂ - 1 52 |
| | 5 | 2 | 24 | ♂ | ♂ ♀ + 4 51 | | | 5 | 8 | - | ♂ ♂ - 1 52 |
| | 5 | 5 | 31 | ♂ | ♂ ♀ + 4 34 | | | | | | ♂ Stationary. |

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

| July | | | | | | Sept. 30 | | | | | |
|---------|----|----|---|---|---|----------|----|----|---|---|---|
| d | h | m | ♂ | ♂ | ♂ | d | h | m | ♂ | ♂ | ♂ |
| 6 | 0 | 55 | ♂ | ♂ | ♂ | 30 | 14 | 4 | ♂ | ♂ | ♂ |
| 6 | 13 | 10 | ♂ | ♂ | ♂ | 30 | 19 | 18 | ♂ | ♂ | ♂ |
| 7 | 17 | - | ♂ | ♂ | ♂ | Oct. 2 | 13 | 52 | ♂ | ♂ | ♂ |
| 10 | 4 | 23 | ♂ | ♂ | ♂ | 2 | 14 | 10 | ♂ | ♂ | ♂ |
| 11 | 7 | - | ♂ | ♂ | ♂ | 4 | 0 | 43 | ♂ | ♂ | ♂ |
| 12 | 4 | 2 | ♂ | ♂ | ♂ | 8 | 3 | 17 | ♂ | ♂ | ♂ |
| 13 | 22 | 1 | ♂ | ♂ | ♂ | 12 | 10 | 17 | ♂ | ♂ | ♂ |
| 18 | 11 | - | ♂ | ♂ | ♂ | 13 | 18 | 38 | ♂ | ♂ | ♂ |
| 19 | 17 | - | ♂ | ♂ | ♂ | 16 | 13 | 32 | ♂ | ♂ | ♂ |
| 24 | 2 | - | ♂ | ♂ | ♂ | 19 | 22 | 37 | ♂ | ♂ | ♂ |
| 29 | 14 | 33 | ♂ | ♂ | ♂ | 24 | 18 | - | ♂ | ♂ | ♂ |
| 30 | 0 | 12 | ♂ | ♂ | ♂ | 25 | 19 | 23 | ♂ | ♂ | ♂ |
| Aug. 2 | 20 | 4 | ♂ | ♂ | ♂ | 27 | 9 | 27 | ♂ | ♂ | ♂ |
| 3 | 18 | 29 | ♂ | ♂ | ♂ | 28 | 8 | 11 | ♂ | ♂ | ♂ |
| 4 | 15 | 25 | ♂ | ♂ | ♂ | 29 | 2 | 20 | ♂ | ♂ | ♂ |
| 6 | 2 | 6 | ♂ | ♂ | ♂ | 30 | - | - | ♂ | ♂ | ♂ |
| 6 | 17 | 13 | ♂ | ♂ | ♂ | 31 | 10 | 28 | ♂ | ♂ | ♂ |
| 10 | 6 | 47 | ♂ | ♂ | ♂ | 31 | 14 | 40 | ♂ | ♂ | ♂ |
| 13 | 8 | 0 | ♂ | ♂ | ♂ | Nov. 1 | 7 | 1 | ♂ | ♂ | ♂ |
| 14 | 21 | 23 | ♂ | ♂ | ♂ | 2 | 2 | 24 | ♂ | ♂ | ♂ |
| 16 | 7 | - | ♂ | ♂ | ♂ | 3 | 5 | 40 | ♂ | ♂ | ♂ |
| 20 | 7 | 17 | ♂ | ♂ | ♂ | 7 | 0 | 23 | ♂ | ♂ | ♂ |
| 20 | 21 | - | ♂ | ♂ | ♂ | 10 | 1 | 42 | ♂ | ♂ | ♂ |
| 21 | 14 | 56 | ♂ | ♂ | ♂ | 10 | 19 | 39 | ♂ | ♂ | ♂ |
| 25 | 10 | - | ♂ | ♂ | ♂ | 15 | - | - | ♂ | ♂ | ♂ |
| 26 | 6 | 35 | ♂ | ♂ | ♂ | 16 | 8 | 13 | ♂ | ♂ | ♂ |
| 29 | 15 | - | ♂ | ♂ | ♂ | 24 | 20 | 42 | ♂ | ♂ | ♂ |
| Sept. 1 | 3 | - | ♂ | ♂ | ♂ | 26 | 23 | 44 | ♂ | ♂ | ♂ |
| 1 | 12 | 1 | ♂ | ♂ | ♂ | 27 | 21 | 8 | ♂ | ♂ | ♂ |
| 2 | 2 | 35 | ♂ | ♂ | ♂ | 29 | 10 | - | ♂ | ♂ | ♂ |
| 3 | 6 | 18 | ♂ | ♂ | ♂ | 30 | - | - | ♂ | ♂ | ♂ |
| 3 | 17 | 39 | ♂ | ♂ | ♂ | Dec. 1 | 4 | 55 | ♂ | ♂ | ♂ |
| 4 | 5 | 31 | ♂ | ♂ | ♂ | 1 | 5 | 1 | ♂ | ♂ | ♂ |
| 5 | 5 | 4 | ♂ | ♂ | ♂ | 2 | 8 | 31 | ♂ | ♂ | ♂ |
| 6 | 15 | 38 | ♂ | ♂ | ♂ | 2 | 9 | 5 | ♂ | ♂ | ♂ |
| 11 | 15 | - | ♂ | ♂ | ♂ | 4 | 21 | 55 | ♂ | ♂ | ♂ |
| 11 | 21 | 16 | ♂ | ♂ | ♂ | 6 | 11 | - | ♂ | ♂ | ♂ |
| 12 | 12 | 3 | ♂ | ♂ | ♂ | 7 | 10 | 42 | ♂ | ♂ | ♂ |
| 12 | 20 | 30 | ♂ | ♂ | ♂ | 10 | 22 | 4 | ♂ | ♂ | ♂ |
| 14 | 6 | 24 | ♂ | ♂ | ♂ | 11 | 3 | 46 | ♂ | ♂ | ♂ |
| 16 | 12 | 39 | ♂ | ♂ | ♂ | 13 | 16 | 57 | ♂ | ♂ | ♂ |
| 17 | 21 | 58 | ♂ | ♂ | ♂ | 14 | 16 | 50 | ♂ | ♂ | ♂ |
| 20 | 22 | - | ♂ | ♂ | ♂ | 18 | 18 | - | ♂ | ♂ | ♂ |
| 22 | - | - | ♂ | ♂ | ♂ | 20 | 5 | 20 | ♂ | ♂ | ♂ |
| 22 | 14 | - | ♂ | ♂ | ♂ | 21 | 6 | - | ♂ | ♂ | ♂ |
| 22 | 14 | 57 | ♂ | ♂ | ♂ | 21 | 10 | 43 | ♂ | ♂ | ♂ |
| 23 | 6 | 25 | ♂ | ♂ | ♂ | 22 | 8 | 2 | ♂ | ♂ | ♂ |
| 27 | 20 | - | ♂ | ♂ | ♂ | 24 | 19 | 14 | ♂ | ♂ | ♂ |
| 28 | 4 | - | ♂ | ♂ | ♂ | 25 | 8 | 14 | ♂ | ♂ | ♂ |
| 29 | 11 | 29 | ♂ | ♂ | ♂ | 25 | 21 | 48 | ♂ | ♂ | ♂ |
| 30 | 6 | 25 | ♂ | ♂ | ♂ | 28 | 4 | 45 | ♂ | ♂ | ♂ |
| | | | ♂ | ♂ | ♂ | 30 | 1 | 21 | ♂ | ♂ | ♂ |

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

| Place. | Latitude. | Reduction to Geocentric Latitude. | Log ρ . | Longitude | |
|---------------------------------|-----------------|--|--------------|------------------|-----------------|
| | | | | From Washington. | From Greenwich. |
| Åbo | + 60° 26' 56.8" | - 9 53.5 | 9.998902 | - 6 37 18.45 | - 1 29 6.41 |
| Adelaide | - 34 55 33.8 | + 10 47.6 | 9.999527 | - 14 22 32.34 | - 9 14 20.30 |
| Albany | + 42 39 49.5 | - 11 28.2 | 9.999336 | - 0 13 12.87 | + 4 54 59.17 |
| Alfred (N. Y.) | + 42 15 19.8 | - 11 27.2 | 9.999346 | + 0 2 55.00 | + 5 11 7.04 |
| Algier | + 36 45 2.7 | - 11 1.6 | 9.999483 | - 5 20 23.43 | - 0 12 11.39 |
| Allegheny | + 40 27 41.6 | - 11 21.6 | 9.999391 | + 0 11 50.89 | + 5 20 2.93 |
| Altona | + 53 32 45.3 | - 11 0.8 | 9.999063 | - 5 47 58.39 | - 0 39 46.35 |
| Amherst | + 42 22 17.1 | - 11 27.5 | 9.999343 | - 0 18 7.37 | + 4 50 4.67 |
| Annapolis | + 38 58 53.5 | - 11 15.0 | 9.999428 | - 0 2 15.60 | + 5 5 56.44 |
| Ann Arbor | + 42 16 48.0 | - 11 27.3 | 9.999346 | + 0 26 43.10 | + 5 34 55.14 |
| Arcetri | + 43 45 14.4 | - 11 29.9 | 9.999308 | - 5 53 15.15 | - 0 45 3.11 |
| Armagh | + 54 21 12.7 | - 10 54.9 | 9.999043 | - 4 41 36.54 | + 0 26 35.5 |
| Athens | + 37 58 20.0 | - 11 9.4 | 9.999453 | - 6 43 7.74 | - 1 34 55.7 |
| Beloit | + 42 30 9.0 | - 11 27.8 | 9.999340 | + 0 47 55.26 | + 5 56 7.30 |
| Berlin | + 52 30 16.7 | - 11 7.7 | 9.999088 | - 6 1 46.95 | - 0 53 34.91 |
| Berne | + 46 57 8.7 | - 11 29.2 | 9.999227 | - 5 37 58.04 | - 0 29 46.0 |
| Bethlehem | + 40 36 23.9 | - 11 22.2 | 9.999388 | - 0 6 40.19 | + 5 1 31.85 |
| Birr Castle | + 53 5 47.0 | - 11 3.9 | 9.999074 | - 4 36 31.14 | + 0 31 40.9 |
| Bologna | + 44 29 47.0 | - 11 30.5 | 9.999280 | - 5 53 36.64 | - 0 45 24.6 |
| Bonn | + 50 43 45.0 | - 11 17.3 | 9.999132 | - 5 36 35.33 | - 0 28 23.29 |
| Bordeaux | + 44 50 16.7 | - 11 30.7 | 9.999281 | - 5 6 6.60 | + 0 2 5.44 |
| Bothkamp | + 54 12 9.6 | - 10 56.0 | 9.999047 | - 5 48 42.84 | - 0 40 30.8 |
| Breslau | + 51 6 56.5 | - 11 15.4 | 9.999122 | - 6 16 20.75 | - 1 8 8.71 |
| Brussels | + 50 51 10.5 | - 11 16.8 | 9.999129 | - 5 25 40.64 | - 0 17 28.6 |
| Cambridge (England) | + 52 12 51.6 | - 11 9.4 | 9.999095 | - 5 8 34.79 | - 0 0 22.75 |
| Cambridge (Mass.) | + 42 22 47.6 | - 11 27.6 | 9.999343 | - 0 23 41.05 | + 4 44 30.99 |
| Cape of Good Hope | - 33 56 3.4 | + 10 39.0 | 9.999550 | - 6 22 6.78 | - 1 13 54.74 |
| Chapultepec | + 19 25 17.5 | - 7 12.0 | 9.999841 | + 1 28 26.20 | + 6 36 38.24 |
| Charkow | + 50 0 10.2 | - 11 20.5 | 9.999150 | - 7 33 6.74 | - 2 24 54.7 |
| Chicago | + 41 50 1.0 | - 11 26.2 | 9.999357 | + 0 42 14.69 | + 5 50 26.73 |
| Christiania | + 59 54 43.7 | - 10 0.2 | 9.998914 | - 5 51 5.89 | - 0 42 53.85 |
| Cincinnati (New Obs.) | + 39 8 19.5 | - 11 15.8 | 9.999424 | + 0 29 29.25 | + 5 37 41.29 |
| Cincinnati (Old Obs.) | + 39 6 26.5 | - 11 15.6 | 9.999425 | + 0 29 47.01 | + 5 37 59.05 |
| Clinton | + 43 3 17.0 | - 11 28.9 | 9.999326 | - 0 6 34.65 | + 5 1 37.39 |
| Coimbra | + 40 12 25.8 | - 11 20.6 | 9.999393 | - 4 34 37.54 | + 0 33 34.5 |
| Copenhagen | + 55 41 13.6 | - 10 43.9 | 9.999011 | - 5 58 30.96 | - 0 50 18.92 |
| Cordoba | - 31 25 15.5 | + 10 13.5 | 9.999608 | - 0 51 23.84 | + 4 16 48.2 |
| Cracow | + 50 3 50.0 | - 11 20.3 | 9.999149 | - 6 28 2.41 | - 1 19 50.37 |
| Dantzic | + 54 21 18.0 | - 10 54.9 | 9.999043 | - 6 22 51.34 | - 1 14 39.3 |
| Dorpat | + 58 22 47.4 | - 10 17.6 | 9.998948 | - 6 55 5.54 | - 1 46 53.5 |
| Dresden | + 51 2 16.8 | - 11 15.8 | 9.999124 | - 6 3 6.88 | - 0 54 54.84 |
| Dublin | + 53 23 13 | - 11 1.9 | 9.999066 | - 4 42 50.04 | + 0 25 22 |
| Düsseldorf | + 51 12 25 | - 11 15.0 | 9.999120 | - 5 35 17.04 | - 0 27 5 |
| Dun Echt | + 57 9 36 | - 10 30.2 | 9.998977 | - 4 58 32.04 | + 0 9 40.0 |
| Durham | + 54 46 6.2 | - 10 51.6 | 9.999033 | - 5 1 52.24 | + 0 6 19.8 |
| Edinburgh | + 55 57 23.2 | - 10 41.5 | 9.999005 | - 4 55 28.99 | + 0 12 43.05 |
| Florence | + 43 46 4.1 | - 11 29.9 | 9.999308 | - 5 53 13.54 | - 0 45 1.5 |

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

| Place. | Latitude. | Reduction to Geocentric Latitude. | Log ρ . | Longitude | |
|----------------------------|--------------|--|--------------|------------------|-----------------|
| | | | | From Washington. | From Greenwich. |
| Geneva . . . | + 46 11 58.8 | - 11 30.1 | 9.999246 | - 5 32 48.81 | - 0 24 36.77 |
| Georgetown . . . | + 38 54 26.2 | - 11 14.6 | 9.999430 | + 0 0 6.20 | + 5 8 18.24 |
| Glasgow (Missouri) . . . | + 39 13 45.6 | - 11 16.2 | 9.999422 | + 1 3 5.93 | + 6 11 17.97 |
| Glasgow (Scotland) . . . | + 55 52 42.8 | - 10 42.2 | 9.999006 | - 4 51 1.44 | + 0 17 10.6 |
| Göttingen . . . | + 51 31 47.9 | - 11 13.3 | 9.999112 | - 5 47 58.28 | - 0 39 46.24 |
| Gotha . . . | + 50 56 37.5 | - 11 16.3 | 9.999197 | - 5 51 2.57 | - 0 42 50.53 |
| Greenwich . . . | + 51 28 38.4 | - 11 13.6 | 9.999113 | - 5 8 12.04 | 0 0 0 |
| Hamburg . . . | + 53 33 7.0 | - 11 0.8 | 9.999062 | - 5 48 5.74 | - 0 39 53.7 |
| Hanover . . . | + 43 42 15 | - 11 29.8 | 9.999309 | - 0 19 4.13 | + 4 49 7.91 |
| Hastings-on-Hudson . . . | + 40 59 25 | - 11 23.6 | 9.999378 | - 0 12 42.4 | + 4 55 29.64 |
| Haverford . . . | + 40 0 40.1 | - 11 19.8 | 9.999402 | - 0 6 59.34 | + 5 1 12.70 |
| Helsingfors . . . | + 60 9 43.3 | - 9 57.1 | 9.998909 | - 6 48 1.20 | - 1 39 49.16 |
| Hudson . . . | + 41 14 42.6 | - 11 24.4 | 9.999371 | + 0 17 32.12 | + 5 25 44.16 |
| Ipswich . . . | + 52 0 33.0 | - 11 11.0 | 9.999100 | - 5 13 7.84 | - 0 4 55.80 |
| Karlsruhe . . . | + 49 0 29.6 | - 11 24.2 | 9.999175 | - 5 41 48.55 | - 0 33 36.51 |
| Kasan . . . | + 55 47 24.2 | - 10 43.0 | 9.999009 | - 8 24 40.94 | - 3 16 28.9 |
| Kew . . . | + 51 28 6 | - 11 13.6 | 9.999114 | - 5 6 56.94 | + 0 1 15.1 |
| Kiel . . . | + 54 20 29.7 | - 10 55.0 | 9.999043 | - 5 48 47.80 | - 0 40 35.76 |
| Kiew . . . | + 50 27 11.1 | - 11 18.6 | 9.999139 | - 7 10 12.68 | - 2 2 0.64 |
| Königsberg . . . | + 54 42 50.6 | - 10 52.0 | 9.999034 | - 6 30 10.95 | - 1 21 58.91 |
| Kremsmünster . . . | + 48 3 23.7 | - 11 27.0 | 9.999199 | - 6 4 44.24 | - 0 56 32.2 |
| Leiden . . . | + 52 9 20.0 | - 11 9.8 | 9.999097 | - 5 26 8.39 | - 0 17 56.35 |
| Leipzig . . . | + 51 20 6.3 | - 11 14.3 | 9.999117 | - 5 57 46.06 | - 0 49 34.02 |
| Leyton . . . | + 51 34 34 | - 11 13.0 | 9.999111 | - 5 8 11.17 | + 0 0 0.87 |
| Lisbon (Marine Obs.) . . . | + 38 42 17.6 | - 11 13.5 | 9.999435 | - 4 31 47.04 | + 0 36 25.0 |
| Lisbon (Royal Obs.) . . . | + 38 42 31.3 | - 11 13.6 | 9.999435 | - 4 31 27.36 | + 0 36 44.68 |
| Liverpool . . . | + 53 24 4 | - 11 1.8 | 9.999066 | - 4 55 54.84 | + 0 12 17.2 |
| Lübeck . . . | + 53 51 31.2 | - 10 58.6 | 9.999055 | - 5 50 57.59 | - 0 42 45.55 |
| Lund . . . | + 55 41 52.1 | - 10 43.8 | 9.999011 | - 6 0 57.07 | - 0 52 45.03 |
| Lyons . . . | + 45 41 40.0 | - 11 30.5 | 9.999259 | - 5 27 19.90 | - 0 19 7.86 |
| Madison . . . | + 43 4 37.0 | - 11 28.9 | 9.999325 | + 0 49 25.79 | + 5 57 37.83 |
| Madras . . . | + 13 4 8.1 | - 5 3.3 | 9.999926 | - 10 29 11.46 | - 5 20 59.42 |
| Madrid . . . | + 40 24 30.0 | - 11 21.4 | 9.999393 | - 4 53 26.64 | + 0 14 45.4 |
| Manheim . . . | + 49 29 11.0 | - 11 22.5 | 9.999163 | - 5 42 2.56 | - 0 33 50.52 |
| Marburg . . . | + 50 48 46.9 | - 11 16.9 | 9.999130 | - 5 43 17.04 | - 0 35 5.0 |
| Markree . . . | + 54 10 31.8 | - 10 56.2 | 9.999047 | - 4 34 23.64 | + 0 33 48.4 |
| Marseilles . . . | + 43 18 19.1 | - 11 29.3 | 9.999320 | - 5 29 46.68 | - 0 21 34.64 |
| Melbourne . . . | - 37 49 53.3 | + 11 8.6 | 9.999456 | - 14 48 6.18 | - 9 39 54.14 |
| Mexico . . . | + 19 26 1.3 | - 7 12.2 | 9.999840 | + 1 28 14.63 | + 6 36 26.67 |
| Milan . . . | + 45 27 59.2 | - 11 30.6 | 9.999265 | - 5 44 58.01 | - 0 36 45.97 |
| Modena . . . | + 44 38 52.8 | - 11 30.6 | 9.999285 | - 5 51 54.84 | - 0 43 42.8 |
| Montsouris . . . | + 48 49 18.0 | - 11 24.8 | 9.999180 | - 5 17 32.72 | - 0 9 20.68 |
| Moscow . . . | + 55 45 19.8 | - 10 43.3 | 9.999009 | - 7 38 28.94 | - 2 30 16.9 |
| Mount Hamilton . . . | + 37 20 23.5 | - 11 5.5 | 9.999468 | + 2 58 22.05 | + 8 6 34.09 |
| Munich . . . | + 48 8 45.5 | - 11 26.7 | 9.999197 | - 5 54 38.17 | - 0 46 26.13 |
| Naples . . . | + 40 51 45.4 | - 11 23.1 | 9.999381 | - 6 5 12.94 | - 0 57 0.9 |
| Nashville . . . | + 36 8 58.2 | - 10 57.3 | 9.999497 | + 0 38 55.93 | + 5 47 7.97 |

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

| Place. | Latitude. | Reduction to Geocentric Latitude. | Log ρ . | Longitude | |
|------------------------------------|----------------|--|--------------|-----------------------------------|----------------------------------|
| | | | | From Washington. | From Greenwich. |
| Natal | - 29° 50' 47.0 | + 9 55.2 | 9.999642 | ^h 7 ^m 13.20 | ^h 2 ^m 1.16 |
| Neuchatel | + 46 59 51.0 | - 11 29.1 | 9.999226 | - 5 36 2.24 | - 0 27 50.2 |
| New Haven | + 41 18 36.5 | - 11 24.6 | 9.999370 | - 0 16 29.90 | + 4 51 42.14 |
| New York (<i>Columb. Coll.</i>) | + 40 45 23.1 | - 11 22.7 | 9.999384 | - 0 12 18.40 | + 4 55 53.64 |
| New York (<i>RUTHERFORD</i>) | + 40 43 48.5 | - 11 22.6 | 9.999384 | - 0 12 15.00 | + 4 55 57.04 |
| Nice | + 43 43 16.7 | - 11 20.8 | 9.999309 | - 5 37 24.24 | - 0 29 12.20 |
| Nicolaëff | + 46 58 20.6 | - 11 29.2 | 9.999226 | - 7 16 6.14 | - 2 7 54.1 |
| Odessa | + 46 28 36 | - 11 29.8 | 9.999239 | - 7 11 14.34 | - 2 3 2.3 |
| Ogden | + 41 13 8.6 | - 11 24.3 | 9.999372 | + 2 19 47.52 | + 7 27 59.56 |
| Ö-Gyalla | + 47 52 43.4 | - 11 27.4 | 9.999204 | - 6 20 57.63 | - 1 12 45.59 |
| Olmütz | + 49 35 43 | - 11 22.1 | 9.999160 | - 6 17 14.64 | - 1 9 2.6 |
| Oxford (<i>Mississippi</i>) | + 34 22 12.6 | - 10 42.9 | 9.999540 | + 0 49 55.05 | + 5 58 7.09 |
| Oxford (<i>Radcliffe</i>) . . . | + 51 45 36.0 | - 11 12.0 | 9.999106 | - 5 3 9.44 | + 0 5 2.6 |
| Oxford (<i>University</i>) . . . | + 51 45 34.2 | - 11 12.0 | 9.999106 | - 5 3 11.64 | + 0 5 0.40 |
| Padua | + 45 24 2.5 | - 11 30.6 | 9.999266 | - 5 55 41.17 | - 0 47 29.13 |
| Palermo | + 38 6 44 | - 11 10.2 | 9.999449 | - 6 1 37.04 | - 0 53 25.0 |
| Paramatta | - 33 48 49.8 | + 10 37.8 | 9.999553 | - 15 12 18.24 | - 10 4 6.2 |
| Paris | + 48 50 11.8 | - 11 24.8 | 9.999179 | - 5 17 32.99 | - 0 9 20.95 |
| Philadelphia | + 39 57 7.5 | - 11 19.5 | 9.999404 | - 0 7 33.58 | + 5 0 38.46 |
| Plonsk | + 52 37 40.0 | - 11 6.9 | 9.999085 | - 6 29 44.05 | - 1 21 32.01 |
| Pola | + 44 51 49.0 | - 11 30.6 | 9.999280 | - 6 3 35.22 | - 0 55 23.18 |
| Portsmouth | + 50 48 3.0 | - 11 17.0 | 9.999130 | - 5 3 48.14 | + 0 4 23.90 |
| Potsdam | + 52 22 56 | - 11 8.4 | 9.999091 | - 6 0 29.04 | - 0 52 17 |
| Poughkeepsie | + 41 41 18 | - 11 25.8 | 9.999360 | - 0 12 38.44 | + 4 55 33.6 |
| Prague | + 50 5 18.8 | - 11 20.2 | 9.999148 | - 6 5 53.44 | - 0 57 41.4 |
| Princeton | + 40 20 57.8 | - 11 21.2 | 9.999394 | - 0 9 34.54 | + 4 58 37.50 |
| Pulkowa | + 59 46 18.7 | - 10 1.8 | 9.998917 | - 7 9 30.71 | - 2 1 18.67 |
| Quebec | + 46 48 17.3 | - 11 29.4 | 9.999231 | - 0 23 22.74 | + 4 44 49.3 |
| Rio de Janeiro | - 22 54 23.8 | + 8 14.0 | 9.999782 | - 2 15 30.63 | + 2 52 41.41 |
| Rochester | + 43 9 16.8 | - 11 29.0 | 9.999324 | + 0 2 9.74 | + 5 10 21.78 |
| Rome (<i>Coll. Rom.</i>) . . . | + 41 53 53.6 | - 11 26.3 | 9.999355 | - 5 58 6.74 | - 0 49 54.70 |
| San Fernando | + 36 27 41.5 | - 10 59.5 | 9.999490 | - 4 43 22.44 | + 0 24 49.6 |
| Santiago de Chile | - 33 26 42.0 | + 10 34.4 | 9.999561 | - 0 25 25.74 | + 4 42 46.30 |
| Schwerin | + 53 37 38.2 | - 11 0.2 | 9.999061 | - 5 53 52.74 | - 0 45 40.7 |
| Senftenberg | + 50 5 10.1 | - 11 20.2 | 9.999148 | - 6 14 2.64 | - 1 5 50.6 |
| South Hadley | + 42 15 18.2 | - 11 27.3 | 9.999346 | - 0 17 51.75 | + 4 50 20.29 |
| Speier | + 49 18 55.4 | - 11 23.2 | 9.999167 | - 5 41 57.64 | - 0 33 45.6 |
| St. Louis | + 38 38 3.6 | - 11 13.2 | 9.999437 | + 0 52 37.07 | + 6 0 49.11 |
| St. Petersburg | + 59 56 29.7 | - 9 59.8 | 9.998913 | - 7 9 25.54 | - 2 1 13.5 |
| Stockholm | + 59 20 33.0 | - 10 6.9 | 9.998927 | - 6 20 26.04 | - 1 12 14.00 |
| Stonyhurst | + 53 50 40 | - 10 58.7 | 9.999055 | - 4 58 19.36 | + 0 9 52.68 |
| Strassburg (<i>New Obs.</i>) | + 48 34 59.7 | - 11 25.5 | 9.999186 | - 5 39 16.69 | - 0 31 4.65 |
| Strassburg (<i>Old Obs.</i>) | + 48 34 53.8 | - 11 25.5 | 9.999186 | - 5 39 14.53 | - 0 31 2.49 |
| Sydney | - 33 51 41.1 | + 10 38.3 | 9.999552 | - 15 13 1.58 | - 10 4 49.54 |
| Taschkent | + 41 19 32.2 | - 11 24.7 | 9.999369 | - 9 45 22.84 | - 4 37 10.80 |
| Toulouse | + 43 36 47 | - 11 29.7 | 9.999312 | - 5 14 3.14 | - 0 5 51.1 |
| Turin | + 45 4 6.0 | - 11 30.7 | 9.999275 | - 5 39 0.44 | - 0 30 48.4 |

POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

| Place. | Latitude. | Reduction to Geocentric Latitude. | Log ρ . | Longitude | |
|----------------------------------|----------------|--|--------------|------------------|-----------------|
| | | | | From Washington. | From Greenwich. |
| Twickenham . . . | + 51° 27' 4.2" | - 11' 13.7" | 9.999114 | - 5 6 58.94 | + 0 1 13.1 |
| Univ. of Virginia . . | + 38 2 1.2 | - 11 9.8 | 9.999448 | + 0 5 53.18 | + 5 14 5.22 |
| Upsala | + 59 51 31.5 | - 10 0.8 | 9.998915 | - 6 18 42.23 | - 1 10 30.19 |
| Utrecht | + 52 5 10.5 | - 11 10.2 | 9.999098 | - 5 28 43.74 | - 0 20 31.7 |
| Venice | + 45 25 49.5 | - 11 30.6 | 9.999266 | - 5 57 37.44 | - 0 49 25.4 |
| Vienna (<i>Josephstadt</i>) | + 48 12 53.8 | - 11 26.6 | 9.999195 | - 6 13 37.34 | - 1 5 25.3 |
| Vienna (<i>New Obs.</i>) . . | + 48 13 55.4 | - 11 26.5 | 9.999195 | - 6 13 33.26 | - 1 5 21.22 |
| Vienna (<i>Old Obs.</i>) . . | + 48 12 35.5 | - 11 26.6 | 9.999195 | - 6 13 43.78 | - 1 5 31.74 |
| Warsaw | + 52 13 5.7 | - 11 9.4 | 9.999095 | - 6 32 19.44 | - 1 24 7.4 |
| Washington | + 38 53 38.8 | - 11 14.5 | 9.999430 | 0 0 0 | + 5 8 12.04 |
| West Point | + 41 23 31 | - 11 24.9 | 9.999368 | - 0 12 22.71 | + 4 55 49.33 |
| Wilhelmshaven . . . | + 53 31 52.0 | - 11 0.9 | 9.999063 | - 5 40 47.25 | - 0 32 35.21 |
| Williamstown (<i>Mass.</i>) | + 42 42 49 | - 11 28.3 | 9.999334 | - 0 15 18.6 | + 4 52 53.44 |
| Williamstown (<i>Victoria</i>) | - 37 52 7.2 | + 11 8.8 | 9.999455 | - 14 47 50.84 | - 9 39 38.8 |
| Wilna | + 54 41 0 | - 10 52.3 | 9.999035 | - 6 49 23.94 | - 1 41 11.9 |
| Windsor | - 33 36 28.9 | + 10 35.9 | 9.999558 | - 15 11 32.81 | - 10 3 20.77 |
| Zürich | + 47 22 40.0 | - 11 28.5 | 9.999216 | - 5 42 24.64 | - 0 34 12.6 |

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

PART I—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

THE greater portion of this Ephemeris, embracing the positions of the sun and moon; the distances of the moon from the centres of the sun and the four most conspicuous planets, and from certain fixed stars; the ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder contains the ephemerides of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the sun, the moon's longitude and latitude, data for the libration of the moon, the obliquity of the ecliptic, the equation of the equinoxes, etc.

TIME.

Astronomers make use of several different kinds of time: mean solar time; true, or apparent solar time; and sidereal time.

Solar Time.—Solar time is that used for all the purposes of ordinary life, and is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour-angle of the sun is called *Solar Time*. This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the same meridian are not exactly equal, owing to the varying motion of the earth around the sun, and to the obliquity of the ecliptic. The intervals between the sun's transits over the meridian being unequal it is impossible to regulate a clock or chronometer so that it shall accurately follow the sun.

To avoid the irregularity which would arise from using the true sun as the measure of time, a fictitious sun, called the *Mean Sun*, is supposed to move in the equator with a uniform velocity. This mean sun is supposed to keep, on the average, as near the real sun as is consistent with perfect uniformity of motion; it is sometimes in advance of it, and sometimes behind it, the greatest deviation being about 16 minutes of time.

Mean Solar Time, which is perfectly equable in its increase, is measured by the motion of this mean sun. The clocks in ordinary use and the chronometers used by navigators are regulated to mean solar time.

True, or Apparent Solar Time is measured by the motion of the real sun.

The difference between apparent and mean time is called the *Equation of Time*. By means of it, we change apparent to mean time, or the reverse. Thus, if the apparent time be given, the mean time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I of the Calendar for each month. If the mean time be given, the apparent time is obtained by applying the equation of time as directed by the precept on page II of the Calendar.

Sidereal Time.—Sidereal time is measured by the daily motion of the stars; or, as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascension of the stars is counted. This point is the vernal equinox, and its hour-angle is called *Sidereal Time*. Astronomical clocks, regulated to sidereal time are called sidereal clocks.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over the meridian, and its next succeeding return to the same meridian. It is about $3^m 56^s$ shorter than the mean solar day; $365\frac{1}{4}$ solar days, or a year, being divided into $366\frac{1}{4}$ sidereal days. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 21st of each year the sidereal clock agrees with the mean time, or ordinary clock, and the former gains on the latter about $3^m 46^s$ per day, so that at the end of a year it will have gained an entire day, and will again agree with the mean time clock.

Day.—The *Civil Day*, according to the customs of society, commences at midnight, and comprises twenty-four hours from one midnight to the next following. The hours are counted from 0 to 12 from midnight to noon, after which they are again reckoned from 0 to 12 from noon to midnight. Thus the day is divided into two periods of 12 hours each, of which the first is marked A. M., and the last is marked P. M.

The *Astronomical Day* commences at noon on the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and from the noon of one day to that of the next following. The astronomical as well as the civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first period of the civil day answers to the last part of the preceding astronomical day, and the last period of the civil day corresponds to the first part of the same astronomical day. Thus, January 9th, 2 o'clock, A. M., civil time, is January 8th, 14^h, astronomical time; and January 9th, 2 o'clock, P. M., civil time, is also January 9th, 2^h, astronomical time. The rule, then, for the transformation of civil time into astronomical time is this:—*If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.*

To change astronomical to civil time, we simply write P. M. after it, if it is less than 12 hours. If greater than 12 hours, we subtract 12 hours from it, add 1 to the days, and write A. M. For example, January 3d, 23 hours, astronomical time, is January 4th, 11 o'clock, A. M. civil time.

If the longitude from Greenwich be expressed in time, and, when *west*, added to the local time, or, when *east*, subtracted from the local time, the result is the corresponding Greenwich time. If the local mean time is used, the result is the Greenwich mean time, which ordinarily is that required for the use of this Ephemeris. The rule is the same, whether we use mean or sidereal time.

THE CALENDAR.

The Calendar is divided into twelve months, and to each month are assigned eighteen pages, the contents of which are as follow:—

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension and Declination*, and the *Equation of Time*. Adjoining columns contain the differences of these quantities for one hour. By multiplying this difference by the hours and parts of an hour from Greenwich apparent noon, and adding the amount to, or subtracting it from, the quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of any quantity for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, and, when greater accuracy is required, should be first interpolated for half the hours and parts of an hour of the Greenwich apparent time.

This page is chiefly used when the sun is observed on the meridian, and the local apparent time is $0^h 0^m 0^s$. The longitude from Greenwich expressed in time, if *west*, is at that instant the Greenwich apparent time, or time after Greenwich apparent noon; if *east*, it is time before

Greenwich apparent noon. The longitude of any place is therefore employed in reducing the quantities on this page to apparent noon at the place.

The right ascension of the sun thus reduced is the sidereal time of local apparent noon. The difference between it and the clock time of the meridian passage of the sun is the error of the clock on sidereal time.

The declination of the sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the sun.

As an example of the use of page I:—

Let the sun's declination be required at apparent noon, 1891, May 31, at a place whose longitude is $179^{\circ} 40'$, or $11^{\text{h}} 58^{\text{m}} 40^{\text{s}}$ east from Greenwich:

| | | | | |
|--|---------|--------------|--------------|--------------|
| Local apparent time | May 31, | ^h | ^m | ^s |
| Longitude from Greenwich (subtractive) | | 0 | 0 | 0 |
| Greenwich apparent time | May 30, | 11 | 58 | 40 |
| | | 12 | 1 | 20 |

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $12^{\text{h}}.022$ after Greenwich apparent noon on May 30, or $11^{\text{h}}.978$ before Greenwich apparent noon on May 31.

On page 74 of the Ephemeris we find that the change of declination in one hour is

| | |
|--|--------|
| May 30, at Greenwich apparent noon | 22".33 |
| May 31, at Greenwich apparent noon | 21.38 |
| Difference for one day | 0.95 |

If we want to be very exact, we find the amount of this hourly difference for the time which is half way between Greenwich noon and the time of observation; that is, for 6 hours after Greenwich noon of the 30th, this being half of 12 hours. Six hours is 0.25 of a day; so the calculation is as follows:—

| | |
|--|----------------------------|
| Difference for one hour, May 30 | 22".33 |
| Change for 0.25 of a day or $0''.95 \times 0.25$ | 0.24 |
| Difference at 6 hours after noon | 22.09 |
| $22''.09 \times 12.022 = 265''.6 = 4' 25''.6$ | |
| Declination at Greenwich noon, May 30 | N. $21^{\circ} 46' 27''.6$ |
| Change in 12.022 hours (additive) | 4 25.6 |
| Sun's declination at time of observation | N. $21^{\circ} 50' 53.2''$ |

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is $11^{\text{h}}.978$ before Greenwich noon of May 31; half this interval is about 0.25 of a day, and the hourly motion for the middle of the interval is $21''.63$. Then, we find:—

| | |
|--|----------------------------|
| Declination at Greenwich noon, May 31 | N. $21^{\circ} 55' 12''.3$ |
| Product of $21''.63 \times 11.978 = 259''.1$ (subtractive) | 4 19.1 |
| Sun's declination at time of observation | N. $21^{\circ} 50' 53.2''$ |

It will always be well to make the calculation by both methods, as their agreement will show both to be right.

At sea it is ordinarily sufficient to have the declination to the nearest half minute, and the reduction may be found by Table V of Bowditch's *American Practical Navigator*.

The equation of time, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the apparent time, or the time given by an observation of the sun, to obtain the mean time. The heading of the column directs the manner in which the equation is to be applied. When there is a change in the course of the month from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change takes place. The equation of time, as given on page I, is the mean time of apparent noon, or the hour-angle of the mean sun at that instant.

The Sun's Semidiameter and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The sun's semidiameter is used in reducing the altitude of the upper or lower limb of the sun to the altitude of the center; and in reducing the angular distance of the limb from the moon or some other object, to the distance from the center of the sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the sun's center over the wires of a transit-instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension*, and *Declination*, the *Equation of Time*, and the *Sidereal Time of Mean Noon*. The hourly changes of these quantities are also given, and may be used in reducing them to any Greenwich mean time. The hourly changes may be first intepolated for half the Greenwich time, when great precision is required, in the way described in explaining the calculation of the declination.

The right ascension and declination on pages I and II are affected by aberration, and therefore denote the *apparent* position of the *true* sun. Page II is more conveniently used when the mean time is known. This is the case in most observations of the sun out of the meridian, when the times have been noted by a clock or chronometer regulated to mean time. The quantities on this page can be reduced to mean noon of any place by interpolating for the longitude, as in the example of the sun's declination on the preceding page.

The sun's declination is required for finding the latitude of the place, the local time, and the sun's azimuth and amplitude, from observations of the sun.

The equation of time is needed in finding the mean time from observations of the sun, and the latitude from observations out of the meridian. The heading of the column directs the manner in which it is to be applied to mean time to obtain the apparent time.

The equation of time, as given on page II, is the apparent time of mean noon; and is equivalent to the hour-angle of the true sun at the instant of mean noon.

The sidereal time of mean noon is also the right ascension of the mean sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, $9^{\text{s}}.8565$; or by Table III, appended to this volume, for reducing intervals of mean solar to sidereal time. Table LI of BOWDITCH's *Navigator* may be used for the same purpose when only the nearest quarter of a second is required.

The sun's right ascension and the sidereal time of mean noon, or right ascension of the mean sun, are useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the R. A. of the mean sun for this time, as last explained: this being added to the local mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time, gives the interval of sidereal time from noon. Subtracting from this the corresponding reduction of a sidereal interval to a mean time interval, in Table II, appended to this volume, or Table LII of BOWDITCH's *Navigator*, will give the mean time required. This reduction may also be found by multiplying $9^{\text{s}}.8296$ by the hours and parts of an hour of the given sidereal time.

As examples of the use of page II:—

1.—Let the sun's right ascension and the equation of time be required for 1891, May 15, $9^{\text{h}} 2^{\text{m}} 30^{\text{s}}$, A. M., mean time, at a place whose longitude is $100^{\circ} 10'$, or $6^{\text{h}} 40^{\text{m}} 40^{\text{s}}$, west of Greenwich.

| | | | | | |
|-------------------------------------|---|---|---|---------|--|
| Local astronomical mean time | . | . | . | May 14, | $21^{\text{h}} 2^{\text{m}} 30^{\text{s}}$ |
| Longitude from Greenwich (additive) | . | . | . | . | $6 40 40$ |
| Greenwich mean time. | . | . | . | May 15, | $3 43 10 = 3^{\text{h}}.7194$ |

| <i>Sun's Right Ascension.</i> | | | <i>Equation of Time.</i> | | |
|-------------------------------------|---|--|------------------------------------|-----------------------------------|-------------|
| May 15, Greenwich noon | ^h 3 ^m 27 ^s 53.30 | | May 15, noon | ^m 3 ^s 48.99 | (additive). |
| H. D. $9^{\circ}.872 \times 3.7194$ | $+ 0 36.72$ | | H. D. $-0^{\circ}.015 \times 3.72$ | $- 0.06$ | |
| | <u>3 28 30.02</u> | | | <u>3 48.93</u> | |

In this case, the hourly differences interpolated to half the interval, or 1^h.9 after noon, have been used. The equation of time in this example is additive to mean time. Its reduction could also have been found by Table VI, A., of Bowditch's *Navigator*, but to seconds only.

2.—If the sidereal time is required for the same date and time, we have:—

| | |
|--|---|
| May 15, Sidereal Time (at Greenwich mean noon) | ^h 3 ^m 31 ^s 42.29 |
| Hourly difference $9^{\circ}.8565 \times 3.7194$ | $+ 0 36.66$ |
| Add the local astronomical mean time | <u>21 2 30.00</u> |
| The required sidereal time is (rejecting 24 ^h) | <u>0 34 48.95</u> |

The reduction 0^m 36^s.66 could have been found in Table III corresponding to the Greenwich mean time 3^h 43^m 10^s. Also, by Table LI of Bowditch's *Navigator*, the reduction is 0^m 36^s.7.

3.—On 1891, May 15, A. M., at a place whose longitude is 100° 10' W., suppose the sidereal time to be 0^h 36^m 37^s.16, and that the corresponding mean time is required.

The astronomical day is May 14; the longitude in time, $+6^{\text{h}} 40^{\text{m}} 40^{\text{s}}$, or $+6^{\text{h}}.678$.

| | |
|--|---|
| May 14, Sidereal Time (at Greenwich mean noon) | ^h 3 ^m 27 ^s 45.73 |
| The H. D. $9^{\circ}.8565 \times 6.678$, or the reduction for 6 ^h 40 ^m 40 ^s in Table III | $+ 1 5.82$ |
| The sidereal time of local mean noon | <u>3 28 51.55</u> |
| The given sidereal time (+ 24 ^h , if necessary for the following subtraction) | <u>24 36 37.16</u> |
| Subtracting the first from the second gives the sidereal interval from noon | <u>21 7 45.61 = 21^h.12934</u> |
| $-9^{\circ}.8296 \times 21.12934$, or the reduction for 21 ^h 7 ^m 45 ^s .61 in Table II | $- 3 27.71$ |
| The required astronomical mean time is | <u>May 14, 21 4 17.90</u> |

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude* and *Latitude*, and the *Logarithm of the Radius Vector of the Earth*. The longitudes of the sun are the true longitudes, not corrected for aberration. The longitude is given in two columns, headed λ and λ' ; λ representing the sun's longitude counted from the true equinox of the date; and λ' , the same co-ordinate counted from the mean equinox of the beginning of the year, (January 0^d.0). A column of hourly differences enables the computer to obtain the sun's longitude for any hour from noon. The hourly differences of the logarithm of the radius vector are likewise given. The latitude is referred to the ecliptic of the date.

The last column on page III contains the *Mean Time of Sidereal Noon*; that is, the number of hours, minutes and seconds after Greenwich mean noon when the first point of Aries passes the meridian of Greenwich. It may be reduced to any meridian by interpolating for the longitude, or to any Greenwich sidereal time by means of the hourly difference, $-9^{\circ}.8296$. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time; or, approximately, from Table LII of Bowditch's *Navigator*.

This column may be used in converting sidereal time to mean time instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for May 13, that is the preceding astronomical day.

| | |
|--|--|
| May 14, the mean time of Greenwich sidereal noon is | ^h 20 ^m 28 ^s 52.39 |
| The H. D. $-9^{\circ}.8296 \times 6.678$, or the reduction for long., Table II | $- 1 5.64$ |
| The mean time of local sidereal noon | <u>20 27 46.75</u> |
| Add the given sidereal time | <u>0 36 37.16 = 0^h.6103</u> |
| The sum is | <u>21 4 23.91</u> |
| $-9^{\circ}.8296 \times 0.6103$, or the reduction for 0 ^h 36 ^m 37 ^s .2 in Table II | $- 0 6.00$ |
| The required astronomical mean time | <u>May 14, 21 4 17.91</u> |

Page IV contains *The Moon's Semidiameter* and *Equatorial Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the sun's declination and the equation of time in the preceding examples. The sign plus or minus prefixed to the hourly differences, shows whether the horizontal parallax is increasing or decreasing.

The reduction of the moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.272. It may also be obtained from Table XI of BOWDITCH'S *Navigator*, or by simply computing the proportional part.

If, for example, the semidiameter of the moon is to be taken out for 1891, May 21, 10^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of May 21 is 4".4; then,

$$12^h : 10^h = 4''.4 : 3''.7,$$

which is the correction to be added to the semidiameter at noon, because the semidiameter is increasing.

The moon's semidiameter then, for May 21, 10^h, is 15' 9".3 + 3".7, or 15' 13".0.

The moon's semidiameter and horizontal parallax are required for all observations of the moon. When great precision is needed, the hourly differences should be first interpolated for half the interval of Greenwich time from noon or midnight, and a correction applied to the horizontal parallax for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich*, which is given on page IV to tenths of a minute, is also accompanied with a column of differences for one hour of longitude, by means of which, having the longitude converted into time, the local time of the moon's meridian passage at any other place, may be computed. The reduction may be taken by simple inspection from BOWDITCH'S Table XXVIII. The last column of this page contains the *Age of the moon*, or the time elapsed since the preceding new moon, to tenths of a day.

Pages V—XII contain *The Moon's Right Ascension*, and *Declination*, for each day and hour of Greenwich mean time. They are accompanied with columns of difference for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may be taken from a well-regulated chronometer, or obtained by applying the longitude converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the day and hour of the Greenwich mean time; the *Diff. for 1 Minute* multiplied by the minutes and parts of a minute of the Greenwich time, and the product added to, or subtracted from the quantity, according as the quantity is increasing or decreasing.

Thus, suppose the moon's right ascension and declination are required for 1891, May 1, 10^h 10^m 30^s, astronomical mean time at Greenwich:—

| | <i>Right Ascension.</i> | | | <i>Declination.</i> | | |
|--|-------------------------|--------------|--------------|---------------------|----------|-----------|
| | ^h | ^m | ^s | | | |
| May 1, 10 ^h | 21 | 18 | 46.03 | | S. 20° | 50' 45".9 |
| Diff. 2".4162 × 10.5 | = + 25.37 | | | 9".682 × 10.5 = | + 1 41.7 | |
| May 1, 10 ^h 10 ^m 30 ^s | 21 | 19 | 11.40 | | S. 20 | 49 4.2 |

The differences interpolated for 5^m.2 = 0^h.09 are, for the right ascension 2".4146, and for the declination 9".739, which may be used for greater precision.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the earth.

Pages XIII—XVIII contain the *Lunar Distances*, or the angular distances of the centre of the moon from the centre of the sun, and from the four larger planets and certain fixed stars, as they would appear to an observer at the centre of the earth. They are given for every third hour of Greenwich mean time, beginning at noon; the dates are therefore astronomical. All the distances that can be observed on the same day, are grouped together under that date; and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the sun, planet or star, to indicate that it is on the west, or east side of the moon.

An observer on the earth's surface having measured a lunar distance, corrected it for errors of his instrument and for the semidiameter of the objects, and cleared it from the effects of refraction and parallax, finds the true or geocentric distance, that is, the distance as it would have appeared from the centre of the earth at the moment of observation. With this distance and the distances in the Ephemeris of the same bodies on the same day, the Greenwich mean time of the observation can be found.

To lessen the labor of computation, there is given in the Ephemeris, between every two successive distances, the logarithm of the seconds of time in which the distance changes 1"; or, as it is usually called, the *Proportional Logarithm of the Difference*. It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time we have the following rule:—

Find in the Almanac the two distances between which the true distance falls; take out the nearer of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.

Find the difference between the true distance and the distance taken from the Almanac; and from the proportional logarithm of this difference, as found in the Navigator, subtract the P. L. of Diff. taken from the Almanac.

The result is the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Almanac, when the earlier Almanac-distance is used; to be subtracted from the hours of Greenwich time, when the later Almanac-distance is used.

Another method is, to add the common logarithm of the difference of the true and the Almanac-distances to the P. L. of Diff. of the Almanac; the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. The Table of *Logarithms of small Arcs in Space or Time*, given at the end of the volume for 1871, saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which follows it in the Ephemeris, (or, more strictly, half the difference of the preceding and following ones). With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the Ephemeris are decreasing; and subtracted when they are increasing.

Thus the Greenwich mean time of the observation can be obtained. If the observer has noted the time of observation by a chronometer, the difference of this chronometer-time and the Greenwich mean time will be the error of the chronometer on Greenwich time as found from the lunar distance. In this way lunar distances can be used as a check upon the chronometer. By a series of carefully observed lunar distances on both sides of the moon, the chronometer-error may generally be ascertained within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude. A longitude derived by this method should always be considered as uncertain by 5' or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1891, May 12, the corrected distance of the moon's centre from that of Regulus is $40^{\circ} 3'$:—

| | | | | | | |
|---|---|---|---|---|-----------------------|--------------|
| Corrected distance | . | . | . | . | 40° 3' 0" | |
| Distance in Ephemeris May 12, VI ^h | . | . | . | . | 40 57 39 | P. L. 0.2843 |
| Difference | . | . | . | . | 0 54 39 | P. L. 0.5177 |
| | | | | | | P. L. 0.2334 |
| Time from VI ^h (after) | . | . | . | . | ^h +1 45 10 | |
| Corr. for 2d Diff., Table I | . | . | . | . | — 5 | |
| Greenwich mean time May 12. | . | . | . | . | 7 45 5 | |

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:—

| | | |
|--|-------|--------|
| From Ephemeris | P. L. | 0.2843 |
| Diff. of distances, $54' 39'' = 3279''$ | log | 3.5157 |
| Red. of Greenwich time, $6310^s = 1^h 45^m 10^s$ | log | 3.8000 |

The result is the same as by the previous method.

Pages 218—249 contain the geocentric ephemerides of the seven major planets. The positions are referred to the equator and true equinox of the date, and corrected for aberration; they are, therefore, apparent positions. All the data except meridian passage are given for the moment of Greenwich mean noon. The column *Meridian Passage* gives the hour, minute and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it has been observed for time, latitude or azimuth. The mode of reducing them to any instant of Greenwich mean time is the same as in the examples for the sun, previously given. The local mean time of passage across any other meridian can be found by dividing the daily differences by 24, and multiplying the quotient by the hours and fractions of the longitude of the place. The product is subtractive from the time of Greenwich passage when the place is east of Greenwich, and additive when west. The corrections can never exceed one-half the change for one day.

Pages 250—263 contain the heliocentric positions of the seven major planets, and the logarithms of their distances from the earth. The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The daily motion is given for the moment of Greenwich mean noon. The column *Reduction to Orbit* gives the correction to be applied to the heliocentric longitudes in order to obtain the longitude counted along the orbit of the planet. This longitude is equal to the distance of the node from the mean equinox, plus the distance of the planet from the node. The heliocentric latitude is counted from the moving plane of the ecliptic. The *Logarithm of Radius Vector* is the logarithm of the distance of the centre of the planet from that of the sun, at each Greenwich mean noon given in the first column. The last two columns give, in the same way, the logarithm of the true distance of the centre of the planet from that of the earth. The one column gives the quantity for the Greenwich noon indicated on the left hand side of the page, and the other for the noon which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean noon of the day immediately following; in the case of Venus, Mars, Jupiter, and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 264—271 contain the rectangular co-ordinates of the centre of the sun, referred to the centre of the earth as the origin, and to the true equator and equinox of each date as the circle and point of reference. Each co-ordinate is given first for Greenwich mean noon, and in the column following for mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan. 0* give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of January 0.

Pages 272—275 give the longitude and latitude of the moon for every Greenwich mean noon and midnight. Both quantities are referred to the true ecliptic and equinox of the date.

Pages 276 and 277 contain the position of the moon's equator and the mean longitude of the moon, and a table for computing the libration of the moon. The epochs of greatest libration of the moon, together with the formulæ for finding the libration in longitude and latitude are given on page 421.

Page 278 contains, for each tenth Greenwich mean noon, the values of the principal elements arising from the motion of the equinox, and also the aberration and parallax of the sun. The column *Apparent Obliquity of the Ecliptic* (HANSEN) gives the true inclination of the earth's

equator to the ecliptic, without correction for the terms depending on the moon's longitude. The *Equation of Equinoxes* is really the astronomical nutation; that given *In Longitude* is the correction to be applied to the longitude of the body referred to the mean equinox, in order to obtain that longitude as referred to the true equinox. When the correction is positive, the true longitudes are greater than those referred to the mean equinox; while the contrary is true when the correction has the negative sign. The equation *In R. A.* is equal to that in longitude, multiplied by the cosine of the obliquity of the ecliptic.

The next column gives the *Precession of Equinoxes in Longitude*, from January 0 to each of the dates following. The *Sun's Aberration* is the quantity which is to be applied to the true longitude of the sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The *Sun's Equatorial Horizontal Parallax*, given in the next column, is the angle subtended by the radius of the earth's equator, as seen from the centre of the sun.

PART II—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 280 contains the formulæ for reducing the positions of the fixed stars, using the notation of BESSEL, and the constants of PETERS and STRUVE. The formulæ by which the star-numbers are computed are also given.

Pages 281—284 contain the logarithms of the *Besselian Star-Numbers*, *A*, *B*, *C*, *D*, for each Washington mean midnight. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given. If used in accordance with the English and French notation, the pair of quantities *A* and *B* must be interchanged with the pair *C* and *D*; that is, *A* must be interchanged with *C*, and *B* with *D*. In the first column along with the solar day is given, for certain dates, the sidereal hour and tenth of midnight. The sidereal time for which any set of quantities is given can be found by interpolation from these numbers.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:—

Computation of the apparent place of α Hydra for 1891, Feb. 14, for the upper transit at Washington.

| | | | | | | | | |
|------------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|--------|
| (Star-Catalogue) | $\log a$ | 0.4699 | $\log b$ | 7.8696 | $\log c$ | 8.7161 <i>n</i> | $\log d$ | 8.6313 |
| (Page 281) | $\log A$ | 9.2393 <i>n</i> | $\log B$ | 0.5207 <i>n</i> | $\log C$ | 1.1931 <i>n</i> | $\log D$ | 1.0550 |
| (Star-Catalogue) | $\log a'$ | 1.1899 <i>n</i> | $\log b'$ | 9.9030 <i>n</i> | $\log c'$ | 9.7159 | $\log d'$ | 9.0413 |
| | $\log Aa$ | 9.7092 <i>n</i> | $\log Bb$ | 8.3903 <i>n</i> | $\log Cc$ | 9.9092 | $\log Dd$ | 9.6863 |
| | $\log Aa'$ | 0.4292 | $\log Bb'$ | 0.3237 | $\log Cc'$ | 0.9090 <i>n</i> | $\log Dd'$ | 0.0963 |

| | | | | |
|--|--------------|--|---------------|--------------------------|
| <i>Mean Place</i> , 1891.0, (page 296) | $\alpha_0 =$ | $9^{\text{h}} 22^{\text{m}} 13.874^{\text{s}}$ | $\delta_0 =$ | $-8^{\circ} 11' 11.26''$ |
| | $Aa =$ | $- .512$ | $Aa' =$ | $+ 2.68$ |
| | $Bb =$ | $- .024$ | $Bb' =$ | $+ 2.11$ |
| | $Cc =$ | $+ .811$ | $Cc' =$ | $- 8.11$ |
| | $Dd =$ | $+ .486$ | $Dd' =$ | $+ 1.25$ |
| | $E =$ | $- .003$ | $\tau \mu' =$ | 0.00 |
| | $\tau \mu =$ | .000 | | |

| | | | | |
|--|------------|--|------------|--------------------------|
| <i>Apparent Place</i> , 1891, Feb. 14, | $\alpha =$ | $9^{\text{h}} 22^{\text{m}} 14.632^{\text{s}}$ | $\delta =$ | $-8^{\circ} 11' 13.33''$ |
|--|------------|--|------------|--------------------------|

Pages 285—292 contain the *Independent Star-Numbers*, which can be used for the same purpose. The column τ gives the fraction of the year from the beginning of the fictitious year to each date. These quantities are connected with those of BESSEL by the relations given on page 280, where are also found the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, *a*, *b*, *c*, *d*, *a'*, *b'*, *c'*, *d'*. The independent star-numbers are given in order that the apparent place of the star may be determined when it is not convenient to compute these numbers.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:—

Computation of the apparent place of α Hydra for 1891, Feb. 14, for the upper transit at Washington.

| | | | |
|------------------------------|-----------------|--------------------------------------|-----------------|
| $\alpha_0 = 140^\circ 33.5'$ | | $\delta_0 = - \quad 8^\circ 11.2'$ | |
| $G = 223^\circ 38'$ | | $G + \alpha_0 = \quad 4^\circ 11.5'$ | |
| $H = 306^\circ 3'$ | | $H + \alpha_0 = 86^\circ 36.5'$ | |
| $\log \gamma_s$ | 8.8239 | $\log \gamma_s$ | 8.8239 |
| $\log g$ | 0.6819 | $\log h$ | 1.2853 |
| $\log \sin (G + \alpha_0)$ | 8.8638 | $\log \sin (H + \alpha_0)$ | 9.9992 |
| $\log \tan \delta_0$ | 9.1579 <i>n</i> | $\log \sec \delta_0$ | 0.0044 |
| $\log (g)$ | 7.5275 <i>n</i> | $\log (h)$ | 0.1128 |
| | | <i>Apparent R. A.,</i> | |
| $\log g$ | 0.6819 | $\log h$ | 1.2853 |
| $\log \cos (G + \alpha_0)$ | 9.9988 | $\log \cos (H + \alpha_0)$ | 8.7720 |
| $\log (g')$ | 0.6807 | $\log \sin \delta_0$ | 9.1535 <i>n</i> |
| | | $\log (h')$ | 9.2108 <i>n</i> |
| | | <i>Apparent Dec.,</i> | |
| $\log i$ | 0.8306 <i>n</i> | | |
| $\log \cos \delta_0$ | 9.9955 | | |
| $\log (i)$ | 0.2861 <i>n</i> | | |

Pages 293—301 contain the mean places of three hundred and eighty-three stars, for the beginning of the fictitious year 1891, or the moment when the sun's mean longitude is 280° .

The annual variations are to be considered as the differential coefficients of each co-ordinate with respect to the time at the beginning of the year.

In order that the list of mean places of stars may serve the purpose of a working-catalogue for the convenient use of astronomers, the position of each of the northern circumpolar stars is given in duplicate, one position being for the upper and the other for the lower culmination. The positions for the lower culmination are marked S. P. In this case, the right ascensions are the sidereal times at which the star crosses the lower meridian; and, in order to have the expressions for the co-ordinates congruous in all cases, the declinations are counted from the equator through the north pole, and therefore exceed 90° . The time of observation and the setting of the circle, in order to find a star on the meridian, are then obtained uniformly for all the stars.

Beginning with the volume of 1882, the number of stars has been greatly increased, in order to make the list more useful to field-astronomers. In order to show at a glance these additional stars, they are indicated in the list by an asterisk.

Pages 302—313 contain the apparent positions of the four north polar stars, α , δ and λ Ursæ Minoris, and 51 Cephei, for every upper transit at Washington. They include the terms depending on the moon's longitude. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26th is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 302, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But, the lower transit following that of July 1st (page 308), does not take place until July 2.3. Hence, the lower transit of July 1st precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column of *Mean Solar Date*.

Pages 314—364 contain, for every tenth upper transit at Washington, the apparent places of those stars of the preceding list which are not marked with an asterisk. The mean solar date in each left hand column gives the day and tenth of the transit; so that each intermediate transit

may be readily identified. Along with each co-ordinate is given, in small type, the change for ten days. This quantity is to be regarded as the differential coefficient corresponding to the dates for which the star-places are given.

Pages 365—376 contain the apparent right ascensions of all stars marked with an asterisk in the list of mean places. The apparent right ascension of each star is given only for that part of the year when it may readily be observed on the meridian. In the case of circumpolar stars, the right ascensions for lower, as well as upper, transit are given.

Pages 377—384 contain the apparent right ascension, declination, and semidiameter of the sun, and the sidereal time, all for Washington mean noon. Adjoining columns give the seconds of right ascension and of declination for apparent noon, that is, for the moment of transit of the sun's centre over the meridian of Washington. The hours and minutes of right ascension, and the degrees and minutes of declination are the same for both mean and apparent noon. In case they would have differed, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that there is always a correspondence between the two numbers. The hourly motions in right ascension and declination are given for the moment of mean noon, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the sun's centre over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich*.

Pages 385—392 contain the right ascension, declination, semidiameter, and parallax of the moon, at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the moon's centre over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the moment of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the moon in right ascension were uniform. By means of them, the position of the moon can be computed with astronomical accuracy at the moment of transit over any meridian not exceeding one hour in longitude from that of Washington, by taking account of second differences. With greater longitudes of the place, the accuracy of the result obtained in this way will diminish. The columns of sidereal time of semidiameter passing meridian, etc., do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When two opposite limbs are both so nearly full that they can be well observed, both are indicated; and the one which is deficient is printed in smaller type. When the illumination is so nearly equal that no choice can be made between them, both are printed in large type.

Pages 393—408 contain the geocentric apparent right ascensions and declinations of the six major planets (Mars not being visible this year) and their semidiameters and horizontal parallaxes, for the moments of all those transits over the meridian of Washington, which can be observed.

PART III—PHENOMENA.

This portion of *The American Ephemeris and Nautical Almanac* gives the principal astronomical phenomena of the year, reduced to Washington mean time, except in the case of the eclipses and the data for the rings of Saturn, which are given in Greenwich mean time.

Pages 410—414 inclusive contain the elements necessary for computing the eclipses of the sun which occur during the year.

The eclipse-elements are given for the moment of conjunction of the sun and moon in right ascension. The subsequent tables and results are not, however, computed from these

elements unchanged; but from the accurate positions of the two bodies as interpolated for each hour of the eclipse. The principal circumstances of each eclipse are as follow:—

On the line "Eclipse begins" is given the Greenwich mean time at which the earth first touches the moon's penumbra, and the longitude and latitude of the point of touching.

The "Central eclipse begins" when the axis of the moon's shadow first touches the earth, and the longitude and latitude of the point of touching follow.

"Central eclipse at noon" indicates the moment when the axis of the shadow is coincident with the plane of the meridian at the point of its intersection with the earth's surface. To the observer at this point, the eclipse will be central at the moment of apparent noon.

"Central eclipse ends" and "Eclipse ends" have the converse meaning of the beginning.

Maps of the Eclipses.—The regions in which each eclipse is visible, are shown upon the maps given in connection with them. From these maps may also be derived the approximate determination of the times of beginning and ending, and of the magnitude of the eclipses at any place. The dotted curves show the outlines of the shadow for each hour of Greenwich mean time and therefore pass through all the places where the eclipse begins or ends at that hour. To find at what hour the eclipse begins at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between these two hours of Greenwich mean time: the fraction of the hour may be determined by dividing the hour proportionally to the space which it represents on the map. This division may be a little more exact by allowing for the changes in this space as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the time at which the eclipse of 1891, June 6, begins and ends at Cape Farewell.

For the beginning we compare the distance of the place from the curves of 4^h and 5^h and we find it to correspond to about 11 minutes from the former, therefore the time of beginning is approximately 4^h 11^m; for the end we compare the distance of the place from the curves of 5^h and 6^h and find it to be about 15 minutes from the latter, therefore the approximate time of end is 5^h 45^m, both of which are probably correct to within 2 or 3 minutes. Changing to local mean time the result will be:—

| | | Beginning. | | | Ending. | |
|---------------------|------|------------|---|----|---------|----|
| | | d | h | m | h | m |
| Greenwich mean time | June | 6 | 4 | 11 | 5 | 45 |
| Longitude West | | | 2 | 56 | 2 | 56 |
| Local mean time | June | 6 | 1 | 15 | 2 | 49 |

In the case of total and annular eclipses, a rough estimate of the magnitude of the eclipse may be obtained from the position of the place relatively to the central line and to the limit. On the central line, the eclipse is annular or total, while on the limit, the limb of the moon only grazes that of the sun.

More Accurate Computations.—A more accurate determination of the phases as visible at any point of the earth's surface may be obtained from the Besselian elements which are given for every ten minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the centre of the earth, perpendicular to the right line joining the centres of the sun and moon. This latter line is the axis of the moon's shadow, and the plane is called the *fundamental plane*. We take the intersection of this plane with that of the earth's equator as the axis of *X*, and the centre of the earth as the origin of co-ordinates. The axis of *Y* is perpendicular to that of *X*, and directed toward the north; *x* and *y* are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane. The angle *d*, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; this direction being that from the earth toward the moon and sun. The angle *μ* is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l and l' are the radii of the shadow-cones upon the fundamental plane, l corresponding to the penumbra, and l' to the umbra, or annulus. The notation is that of CHAUVE-
NET's *Spherical and Practical Astronomy*, in which l' is regarded as positive for an annular,
and negative for a total eclipse.

The angles f and f' , the tangents of which are given, are the angles which the elements of
the respective shadow-cones make with the axis of the shadow; or, they are the semi-angles of
the two cones.

At the bottom of the table are given the logarithms of the change of x , y and μ , in one minute,
in order to facilitate the interpolation to any required moment.

The method of computing the eclipse from the given elements is as follows: It is premised
that the moments of beginning and ending are those at which the distance of the observer from
the axis of the shadow or penumbra is equal to the radius of the latter at the point of observa-
tion. To find such distance and radius we compute—

(1) The co-ordinates, ξ , η and ζ , of the observer, at some assumed moment of Greenwich
mean time, as near as practicable to the true time of the required phase, together with their varia-
tions for one minute.

(2) The co-ordinates x and y of the axis of the shadow at the same moment, which, with their
variations for one minute, are taken from the tables of elements.

(3) Hence, the position and motion of the observer relative to the axis of the shadow.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to
that of the observer.

(5) Then, assuming the motions to be uniform, we determine the time required for the
observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follow:—

(1) Find the geocentric co-ordinates of the station referred to the earth's equator, which are
represented by $\rho \cos \varphi'$ and $\rho \sin \varphi'$, ρ being the distance from the centre of the earth, and φ' the
geocentric latitude. These may be obtained from geodetic tables, or may be computed from the
following table by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Co-ordinates of a Place.

| φ | Log F. | | Log G. | |
|-----------|---------|----|---------|----|
| 0° | 0.00000 | | 0.00302 | 9 |
| 5 | 0.00001 | 1 | 0.00300 | |
| 10 | 0.00005 | 4 | 0.00297 | 3 |
| 15 | 0.00010 | 5 | 0.00292 | 5 |
| 20 | 0.00018 | 8 | 0.00284 | 8 |
| 25 | 0.00027 | 9 | 0.00275 | 9 |
| 30 | 0.00038 | 11 | 0.00264 | 11 |
| 35 | 0.00050 | 12 | 0.00252 | 12 |
| 40 | 0.00062 | 12 | 0.00239 | 13 |
| 45 | 0.00075 | 13 | 0.00226 | 13 |
| 50 | 0.00088 | 13 | 0.00213 | 13 |
| 55 | 0.00101 | 13 | 0.00201 | 12 |
| 60 | 0.00113 | 12 | 0.00189 | 12 |
| 65 | 0.00124 | 11 | 0.00178 | 11 |
| 70 | 0.00133 | 9 | 0.00169 | 9 |
| 75 | 0.00141 | 8 | 0.00161 | 8 |
| 80 | 0.00146 | 5 | 0.00155 | 6 |
| 85 | 0.00150 | 4 | 0.00152 | 3 |
| 90 | 0.00151 | 1 | 0.00151 | 1 |

For the assumed Greenwich mean time of computation, take from the table of elements the values of $\sin d$, $\cos d$, and μ . Put:

λ , the longitude west from Greenwich. The co-ordinates of the observer will then be:—

$$\begin{aligned}\xi &= \rho \cos \varphi' \sin (\mu - \lambda) \\ \eta &= \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) \\ \zeta &= \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda)\end{aligned}$$

and their variations in one minute of mean time will be:—

$$\begin{aligned}\xi' &= [7.63992] \rho \cos \varphi' \cos (\mu - \lambda) \\ \eta' &= [7.63992] \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992] \xi \sin d \\ \zeta' &\text{ is not wanted.}\end{aligned}$$

(2) The co-ordinates x and y of the axis of the shadow are taken from the tables of elements for the same assumed moment of Greenwich mean time, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. The variations for one minute we represent by x' and y' . Their logarithms are given at the foot of the tables.

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N , are computed by the formulæ:—

$$\begin{aligned}m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta'\end{aligned}$$

(4) The radius L of the shadow or penumbra at the distance ζ from the fundamental plane is computed by the formula

$$L = l - \zeta \tan f$$

l and f being found in the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or end of the eclipse, we shall have—

$$m = L$$

But, as this condition can scarcely ever be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values to this angle, of which one will be in the first and the other in the second quadrant when $\sin \psi$ is positive, and one in the third and the other in the fourth when $\sin \psi$ is negative. But, simplicity will be gained by taking only that value of ψ for which $\cos \psi$ is positive. This value lies between the limits $+90^\circ$ and -90° . The correction τ to the assumed time will be found in minutes, from—

$$\text{For beginning:} \quad \tau = - \frac{m \cos (M - N)}{n} - \frac{L \cos \psi}{n}$$

$$\text{For ending:} \quad \tau = - \frac{m \cos (M - N)}{n} + \frac{L \cos \psi}{n}$$

One such pair of values of τ cannot, however, give the times of both beginning and ending with accuracy. To attain accuracy we must, in commencing the computation, assume two times, one near that of beginning, and another near that of ending. These approximate times may be derived from the chart of the eclipse. The computation for the first assumed time will give a small value of τ which, applied to the assumed time, will give a nearly correct time for the beginning of the eclipse, and a large value which, added to the assumed time, will give an inaccurate time of ending. The computation for the second assumed time will give a small and nearly correct value of τ , to be applied to the assumed time for the end, and a large negative and inaccurate one to be subtracted for the beginning. We shall thus deduce two times of each phase only one of which is to be considered approximately correct.

The more accurate times of beginning and ending may now be taken in place of the first assumed ones, and the computation may be repeated from the beginning, leading to a pair of values of τ , which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors. The following theorem will, however, enable us to obtain a second approximation to the true times of each phase without repeating the computation.

THEOREM.—*The error of each result is approximately proportional to the square of the correction τ , multiplied by the sine of the sun's hour-angle, $(\mu-\lambda)$, for the middle of the interval between the time of computation and that of the phase.*

To apply this theorem we find the two values of $\tau^2 \sin(\mu-\lambda)$ corresponding to the required phase. We then find the ratio of these quantities—which will commonly be a large number, and divide the difference of the results by this ratio. The quotient will be a correction to be applied to the more accurate result in such a way as to make it deviate yet more from the less accurate one. This correction should be positive in the local forenoon, and negative in the afternoon, and its value should never materially exceed $0^m.001 \tau^2$.

Unless the times chosen for computation are unusually in error, say ten minutes or more, the corrected results thus obtained will be theoretically correct within less than a second. But to guard against numerical errors it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, further corrections and computations may be made by the computer according to his own judgment.

It may be remarked that the uncertainty of the ephemerides is such that a prediction may be several seconds in error from this unavoidable cause alone.

Position-angle of Point of Contact.—The position-angle P , of the point of contact, reckoned from the north point of the sun's limb toward the east, is found by the formula

$$\text{For beginning:} \quad P = N - \psi \pm 180^\circ$$

$$\text{For end:} \quad P = N + \psi$$

it being assumed that, in each case, the value of ψ is taken between the limits $\pm 90^\circ$.

Computation of the Solar Eclipse of 1891, June 6, for Chicago.

$$\text{Latitude, } \varphi = + 41^\circ 50' 1''$$

$$\text{Longitude, } \lambda = + 87^\circ 36' 41''$$

Constants for the given place:—

$$\rho \sin \varphi' = 9.81317$$

$$\rho \cos \varphi' = 9.87947$$

From the Eclipse Chart the approximate times of the phases are:—

| | | | | | |
|-----------|------|----------------|----------------|-----------------|------------------------|
| Beginning | June | ^d 6 | ^h 3 | ^m 10 | } Greenwich Mean Time. |
| Ending | June | 6 | 3 | 40 | |

| Greenwich Mean Time, | Beginning. 3 ^h 10 ^m | Ending. 3 ^h 40 ^m |
|----------------------|--|---|
| μ | 47° 53.7 | 55° 23.7 |
| λ | 87 36.7 | 87 36.7 |
| $\mu-\lambda$ | 320 17 | 327 47 |
| $\rho \cos \varphi'$ | 9.87947 | 9.87947 |
| $\sin(\mu-\lambda)$ | 9.80550 <i>n</i> | 9.72683 <i>n</i> |
| $\log \xi$ | 9.68497 <i>n</i> | 9.60630 <i>n</i> |
| ξ | — 0.48414 | — 0.40393 |

| Greenwich Mean Time, | | Beginning. 3 ^h 10 ^m | Ending. 3 ^h 40 ^m |
|----------------------|---|--|---|
| | $\rho \sin \varphi'$ | 9.81317 | 9.81317 |
| | $\cos d$ | 9.96507 | 9.96507 |
| | | <u>9.77824</u> | <u>9.77824</u> |
| | (1) | + 0.60012 | + 0.60012 |
| | $\rho \cos \varphi'$ | 9.87947 | 9.87947 |
| | $\sin d$ | 9.58597 | 9.58600 |
| | $\cos (\mu - \lambda)$ | 9.88605 | 9.92739 |
| | | <u>9.35149</u> | <u>9.39286</u> |
| | (2) | + 0.22464 | + 0.24710 |
| (1)-(2) | η | + 0.37548 | + 0.35302 |
| | $\rho \sin \varphi'$ | 9.81317 | 9.81317 |
| | $\sin d$ | 9.58597 | 9.58600 |
| | | <u>9.39914</u> | <u>9.39917</u> |
| | (3) | + 0.25070 | + 0.25071 |
| | $\rho \cos \varphi'$ | 9.87947 | 9.87947 |
| | $\cos d$ | 9.96507 | 9.96507 |
| | $\cos (\mu - \lambda)$ | 9.88605 | 9.92739 |
| | | <u>9.73059</u> | <u>9.77193</u> |
| | (4) | + 0.53776 | + 0.59147 |
| (3)+(4) | ζ | + 0.78846 | + 0.84218 |
| | const. log | 7.63992 | 7.63992 |
| | $\rho \cos \varphi' \cos (\mu - \lambda)$ | 9.76552 | 9.80686 |
| | $\log \xi'$ | 7.40544 | 7.44678 |
| | ξ' | + 0.002543 | + 0.002797 |
| | const. log | 7.63992 | 7.63992 |
| | $\xi \sin d$ | 9.27094 <i>n</i> | 9.19230 <i>n</i> |
| | $\log \eta'$ | 6.91086 <i>n</i> | 6.83222 <i>n</i> |
| | η' | - 0.000814 | - 0.000679 |
| | $x - \xi$ | - 0.29790 | - 0.11145 |
| | $y - \eta$ | + 0.45747 | + 0.53568 |
| | $x' - \xi'$ | + 0.006345 | + 0.006091 |
| | $y' - \eta'$ | + 0.002674 | + 0.002536 |
| | $m \sin M$ | 9.47407 <i>n</i> | 9.04708 <i>n</i> |
| | $m \cos M$ | 9.66037 | 9.72890 |
| | $\tan M$ | 9.81370 <i>n</i> | 9.31818 <i>n</i> |
| | M | 326° 55' 43" | 348° 14' 49" |
| | $\sin M$ | 9.73694 <i>n</i> | 9.30898 <i>n</i> |
| | $\log m$ | 9.73713 | 9.73810 |
| | $n \sin N$ | 7.80243 | 7.78469 |
| | $n \cos N$ | 7.42716 | 7.40415 |
| | $\tan N$ | 0.37527 | 0.38054 |
| | N | 67° 8' 52" | 67° 23' 43" |
| | $\cos N$ | 9.58923 | 9.58476 |
| | $\log n$ | 7.83793 | 7.81939 |

| Greenwich Mean Time, | Beginning. 3 ^h 10 ^m | Ending. 3 ^h 40 ^m |
|-----------------------------|--|---|
| $\log \zeta$ | 9.89679 | 9.92541 |
| $\tan f$ | 7.66336 | 7.66336 |
| | <hr/> 7.56015 | <hr/> 7.58877 |
| $\zeta \tan f$ | 0.003632 | 0.003879 |
| l | 0.547300 | 0.547370 |
| L | <hr/> 0.543668 | <hr/> 0.543491 |
| $\sin (M - N)$ | 9.99306 n | 9.99217 n |
| $\log m$ | 9.73713 | 9.73810 |
| $\csc L$ | 0.26467 | 0.26481 |
| $\sin \psi$ | 9.99486 n | 9.99508 n |
| ψ | - 81° 12' 0" | - 81° 23' 30" |
| $\log \frac{m}{n}$ | 1.89920 | 1.91871 |
| $\cos (M - N)$ | 9.24899 n | 9.27478 |
| | <hr/> 1.14819 n | <hr/> 1.19349 |
| $-\frac{m}{n} \cos (M - N)$ | + 14.067 | - 15.613 |
| $\log L$ | 9.73533 | 9.73519 |
| $\cos \psi$ | 9.18465 | 9.17516 |
| $\csc n$ | 2.16207 | 2.18061 |
| | <hr/> 1.08205 | <hr/> 1.09096 |
| $\frac{L \cos \psi}{n}$ | + 12.079 | + 12.330 |
| τ | + 1.988 | - 3.283 |
| T | d h m June 6 3 10.000 | h m 3 40.000 |
| t | June 6 3 11.988 | 3 36.717 |
| λ | 5 50.445 | 5 50.445 |
| Local Mean Time | June 5 21 21.543 | 21 46.272 |

Therefore we have finally

| | | |
|--------------------------|-------------------|----------------------|
| Beginning of the eclipse | June 5 21 21 32.6 | } Chicago Mean Time. |
| End of the eclipse | June 5 21 46 16.3 | |

Angle of position :

| | | |
|----------------|----------|-----------|
| N | 67° 8.8 | 67° 23.7 |
| $\phi (+ 180)$ | 261 12.0 | - 81 23.5 |
| P | 328 20.8 | 346 0.2 |

from the north point of the sun's limb toward the east.

Elements of Occultations.—Pages 416—443 give the elements for the prediction of the times of occultation of stars and planets by the moon. In the columns referring to the star, those headed *Red'us from 1891.0* give the quantities necessary to reduce the mean place of the star at the beginning of 1891 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

The quantities in the following five columns are all given for the moment of geocentric conjunction of the star and moon in right ascension. Let there be a line passing from the star through the centre of the moon, and let a plane perpendicular to this line pass through the centre of the earth: this plane will be the fundamental plane for the occultation. The system of co-ordinates is similar to that already described for eclipses. The cone circumscribing the moon and star may be regarded as a cylinder having everywhere the same diameter as the moon. This cylinder will intercept the fundamental plane in a circle of which the linear diameter will be the same as that of the moon.

The *Washington Mean Time* is the moment at which the two bodies are in geocentric conjunction in right ascension. At this moment the co-ordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour-Angle H* gives the common geocentric hour-angle of the moon and star at the same moment, counted from the meridian of Washington—positive toward the west and negative toward the east. Column Y gives the co-ordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the hourly variation of x and y . The linear unit in these columns is the earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star behind the limb of the moon may be computed for any part of the earth by a method nearly the same as that already explained for computing eclipses, only more simple.

We shall first show how to compute an isolated occultation for a particular place, assuming it to be visible at that place, and then show how all the occultations which will be visible at a place may be selected and computed by a more rapid process.

(1) The geocentric co-ordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed with three or four places of decimals by the formulæ,

$$\begin{aligned}\rho \sin \varphi' &= \frac{\sin \varphi}{G} \\ \rho \cos \varphi' &= F \cos \varphi\end{aligned}$$

already given in connection with the eclipses.

As in the case of eclipses, it is necessary to have an approximate time of the phenomenon, corresponding to that obtained from the charts of the eclipses. The quantity H being the Washington west hour-angle of the two bodies at the moment of geocentric conjunction, $H - \lambda$ will be the local hour-angle of the star at this same moment. Let us call this angle h_0 , putting

$$h_0 = H - \lambda$$

where λ is the longitude west of *Washington*.

The next step will then be to find the approximate moment of apparent conjunction in right ascension as seen from the place. An approximate correction to reduce the time and hour-angle for geocentric conjunction to those for apparent conjunction may be taken from Mr. DOWNES's table, on pages 444—445. This correction will have the same sign as h_0 .

When this table is not available, the correction may be computed thus: Compute the quantities ξ_0 , ξ' and τ from the formulæ,

$$\begin{aligned}\xi_0 &= \rho \cos \varphi' \sin h_0 \\ \xi' &= [9.4192] \cos (h_0 + \frac{1}{2} h_0) \\ \tau &= \frac{\xi_0}{x' - \xi'}\end{aligned}$$

τ will then be the approximate interval between the times of geocentric and local conjunction.

By applying it to the Washington mean time of the former, as given with the elements, we shall have the Washington mean time of the latter within a few minutes.

The average duration of an occultation is about an hour. Thence, by adding $0^h.5$ to and subtracting it from the mean time of apparent conjunction, we shall have approximate times of the phases of immersion and emersion for farther computation. Let us then put,

$$\tau_1 = \tau - 0^h.5$$

$$\tau_2 = \tau + 0^h.5$$

T , the Washington mean time of geocentric conjunction in R. A.

d , the declination of the star.

(2) Compute for the moments $T + \tau_1$ and $T + \tau_2$ the following quantities, in which we write τ for each of the quantities τ_1 and τ_2 . The latter, when used as angles, are to be changed to arc by multiplying by 15, and the minutes are to be further increased by one-sixth the number of degrees in order to reduce to the sidereal hour-angle.

$$\xi = \rho \cos \varphi' \sin (h_0 + \tau)$$

$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (h_0 + \tau)$$

$$\xi' = [9.4192] \rho \cos \varphi' \cos (h_0 + \tau)$$

$$\eta' = [9.4192] \rho \cos \varphi' \sin d \sin (h_0 + \tau) = [9.4192] \xi \sin d$$

$$x = x' \tau$$

$$y = Y + y' \tau$$

Compute m , M , n and N from the equation.

$$m \sin M = x - \xi$$

$$m \cos M = y - \eta$$

$$n \sin N = x' - \xi'$$

$$n \cos N = y' - \eta'$$

$$n' = \frac{n}{60} = [8.2218] n$$

$$\sin \psi = [0.5650] m \sin (M - N)$$

Then, t_1 and t_2 from the equations

$$t_1 = -\frac{m}{n'} \cos (M - N) - \frac{[9.4350]}{n'} \cos \psi \quad (\text{Beginning.})$$

$$t_2 = -\frac{m}{n'} \cos (M - N) + \frac{[9.4350]}{n'} \cos \psi \quad (\text{End.})$$

The quantities t_1 and t_2 will then be the corrections in minutes to be applied to the respective times $T + \tau_1$ and $T + \tau_2$ to obtain the Washington mean times of the phases.

As in the case of eclipses, the small value of t_1 will give an accurate result for one phase, and the large value an inaccurate result for the other. Both accurate results may then be corrected by comparison with the inaccurate one, in the way described for eclipses, and a result obtained which will probably be correct within a fraction of a minute of time.

As a check upon the result, it will be advisable to compute ξ , η , x and y for the moments finally obtained. If the times are correct these quantities will fulfil the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2723$$

If $\log m \sin (M - N) = 9.4350$ nearly, a recalculation will generally be necessary to determine whether, numerically, $\sin \psi < 1$, or $\sin \psi > 1$. In the latter case, the impossible value of $\sin \psi$ indicates that an occultation at the given place is impossible, unless the computed distance from the moon's limb is within the errors of the ephemerides of the moon and star.

In such cases of near approach to the moon's limb, we may take $\psi = 90^\circ$, or 270° , according as $\sin (M - N)$ is positive or negative; and for finding the time of nearest approach,

$$t = -\frac{m \cos (M - N)}{n'}$$

Putting π for the moon's horizontal parallax, the distance from the moon's limb will be,

$$\pi [m \sin (M - N) - 0.2723]$$

disregarding the sign of $\sin (M - N)$; or, allowing for the augmentation of the semidiameter,

$$\pi [m \sin (M - N) - 0.2723] [1 + z \sin \pi]$$

where

$$z = \rho \cos \varphi' \cos d \cos (h_0 + \tau) + \rho \sin \varphi' \sin d$$

The position-angle P , of the line from the moon's centre to the star at the times of contact, reckoned from the north point toward the east, is given by the formulæ:—

$$P = N - \psi \quad \text{for immersion,}$$

$$P = N + \psi \pm 180^\circ \quad \text{for emersion,}$$

it being supposed that the value of ψ , in each case, is taken between the limits $\pm 90^\circ$.

To find the angle from the vertex, we compute the angle C from the formula,

$$\tan C = \frac{\xi + t \xi'}{\eta + t \eta'}$$

in which the value of t corresponding to the phase is to be used. Then

$$V = P - C$$

is the angle from the vertex, also reckoned from the north toward the east.

As an example of an isolated occultation, we will compute that of ϵ Geminorum, on Feb. 18, 1891, for the University of Virginia, whose position is

$$\varphi = + 38^\circ 2' 1''.2$$

$$\lambda = + 0^\text{h} 5^\text{m} 53^\text{s}.18$$

Constants for the given place,

$$\rho \sin \varphi' = 9.78730$$

$$\rho \cos \varphi' = 9.89689$$

From the table of elements, page 419, we have

$$\begin{array}{rcl} & \text{h} & \text{m} \\ H & = & + 0 \ 1.1 \\ h_0 = H - \lambda & = & - 0 \ 4.786 \end{array}$$

From DOWNES'S Table, pages 444—445, or from the formulæ on page 504, we find the correction to the Washington mean time of geocentric conjunction, as given on page 419, to be $-2^\text{m}.8$, therefore the Washington mean time of apparent conjunction at the given place is Feb. 18^d 8^h 40^{m}.6.}

Since the given place is not far from the centre of the area of visibility we shall assume the duration to be 1 hour and 30 minutes, therefore, by first subtracting and then adding 45 minutes, we shall have the approximate Washington mean times of immersion and emersion to be used in the computation, thus:

| | | | | | |
|-----------------------|---------------------------|------------------------------|------------------|------------------------------|------------------------------|
| | | ^h ^m | | | ^h ^m |
| | $\tau_1 = -$ | 0 47.8 | | $T + \tau_1 =$ | Feb. 18, 7 55.6 |
| | $\tau_2 = +$ | 0 42.2 | | $T + \tau_2 =$ | Feb. 18, 9 25.6 |
| | | | | Immersion. | Emersion. |
| | | | | ^h ^m | ^h ^m |
| Washington Mean Time, | Feb. 18, | | | 7 55.6 | 9 25.6 |
| | h_0 | — | 0 4.786 | — | 0 4.786 |
| | τ (in sidereal time) | — | 0 47.931 | + | 0 42.315 |
| | $h_0 + \tau$ | — | 0 52.717 | + | 0 37.529 |
| | $h_0 + \tau$ (in arc) | — | 13° 10' 45'' | + | 9° 22' 56'' |
| | $\rho \cos \varphi'$ | | 9.89689 | | 9.89689 |
| | $\sin (h_0 + \tau)$ | | 9.35792 <i>n</i> | | 9.21225 |
| | $\log \xi$ | | 9.25481 <i>n</i> | | 9.10914 |
| | ξ | — | 0.17981 | + | 0.12857 |

| Washington Mean Time, | Feb. 18, | Immersion. 7 ^h 55 ^m .6 | Emeraion. 9 ^h 25 ^m .6 |
|-----------------------|--|---|--|
| | $\rho \sin \varphi'$ | 9.78730 | 9.78730 |
| | $\cos d$ | 9.95643 | 9.95643 |
| | | 9.74373 | 9.74373 |
| | (1) | + 0.55429 | + 0.55429 |
| | $\rho \cos \varphi'$ | 9.89689 | 9.89689 |
| | $\sin d$ | 9.62980 | 9.62980 |
| | $\cos (h_0 + \tau)$ | 9.98841 | 9.99415 |
| | | 9.51510 | 9.52084 |
| | (2) | + 0.32742 | + 0.33177 |
| (1) - (2) | η | + 0.22687 | + 0.22252 |
| | const. log | 9.41920 | 9.41920 |
| | $\rho \cos \varphi' \cos (h_0 + \tau)$ | 9.88530 | 9.89104 |
| | $\log \xi'$ | 9.30450 | 9.31024 |
| | ξ' | + 0.20160 | + 0.20428 |
| | const. log | 9.41920 | 9.41920 |
| | $\xi \sin d$ | 8.88461 <i>n</i> | 8.73894 |
| | $\log \eta'$ | 8.30381 <i>n</i> | 8.15814 |
| | η' | - 0.02013 | + 0.01439 |
| | $\log \alpha'$ | 9.74382 | 9.74382 |
| | $\log \tau$ | 9.90128 <i>n</i> | 9.84716 |
| | $\log \alpha$ | 9.64510 <i>n</i> | 9.59098 |
| | α | - 0.44167 | + 0.38993 |
| | $\log y'$ | 7.88081 | 7.88081 |
| | $\log \tau$ | 9.90128 <i>n</i> | 9.84716 |
| | | 7.78209 <i>n</i> | 7.72797 |
| | $y' \tau$ | - 0.006055 | + 0.005345 |
| | Y | + 0.249100 | + 0.249100 |
| | $Y + y' \tau = y$ | + 0.243045 | + 0.254445 |
| | $\alpha - \xi$ | - 0.26186 | + 0.26136 |
| | $y - \eta$ | + 0.01617 | + 0.03192 |
| | $\alpha' - \xi'$ | + 0.35280 | + 0.35012 |
| | $y' - \eta'$ | + 0.02773 | - 0.00679 |
| | $m \sin M$ | 9.41807 <i>n</i> | 9.41724 |
| | $m \cos M$ | 8.20871 | 8.50406 |
| | $\tan M$ | 1.20936 <i>n</i> | 0.91318 |
| | M | 273° 32' 1" | 83° 2' 13" |
| | $\cos M$ | 8.78982 | 9.08362 |
| | $\log m$ | 9.41889 | 9.42044 |
| | $n \sin N$ | 9.54753 | 9.54421 |
| | $n \cos N$ | 8.44295 | 7.83187 <i>n</i> |
| | $\tan N$ | 1.10458 | 1.71234 <i>n</i> |
| | N | 85° 30' 21" | 91° 6' 40" |
| | $\cos N$ | 8.89408 | 8.28760 <i>n</i> |
| | $\log n$ | 9.54887 | 9.54427 |
| | $\log 60$ | 8.22185 | 8.22185 |
| | $\log n'$ | 7.77072 | 7.76612 |

| Washington Mean Time, | Feb. 18, | Immersion. | Emeralson. |
|--|----------------------------------|-----------------------------------|-----------------------------------|
| | const. log | 7 ^h 55 ^m .6 | 9 ^h 25 ^m .6 |
| | log m | 0.56500 | 0.56500 |
| | $\sin (M - N)$ | 9.41889 | 9.42044 |
| | $\sin \psi$ | 9.14504 n | 9.14754 n |
| | ψ | 9.12893 n | 9.13298 n |
| | | — 7° 44' 0'' | — 7° 48' 23'' |
| | $\log \frac{m}{n'}$ | 1.64817 | 1.65432 |
| | $\cos (M - N)$ | 9.99573 n | 9.99567 |
| | | 1.64390 n | 1.64999 |
| | $-\frac{m}{n} \cos (M - N)$ | + 44.045 | — 44.667 |
| | const. log | 9.43500 | 9.43500 |
| | co-log n' | 2.22928 | 2.23388 |
| | $\cos \psi$ | 9.99603 | 9.99596 |
| | | 1.66031 | 1.66484 |
| | $\frac{[9.43500]}{n'} \cos \psi$ | + 45.741 | + 46.221 |
| | t_1 | — 1.696 | + 1.554 |
| | | 7 ^h 55.600 | 9 ^h 25.600 |
| Washington mean time of phase, Feb. 18, | | 7 53.904 | 9 27.154 |
| | λ | + 0 5.886 | 0 5.886 |
| University of Virginia mean time, Feb. 18, | | 7 48.018 | 9 21.268 |
| Angle of position : | | | |
| | N | 85° 30.3 | 91° 6.7 |
| | $\psi (+ 180^\circ)$ | — 7 44.0 | — 7 48.4 |
| | P | 93 14.3 | 263 18.3 |

from the north point of the moon's limb toward the east.

Prediction of Many Occultations for a Given Place.—When it is desired to predict all the occultations which will be visible at some one place, tables may be constructed and applied in such a way as to greatly diminish the labor of computation. In using such tables, the most convenient course will be to find for each occultation the hour-angle of the star at the moment of apparent conjunction in right ascension, as seen from the place of observation. The table of elements, pages 416—443, gives H , the Washington hour-angle at the moment of geocentric conjunction. The corresponding geocentric hour-angle at the place will be

$$h_0 = H - \lambda \quad (\lambda = \text{west longitude from Washington}).$$

The moment of apparent conjunction, as seen from the station, will be given by the condition $\xi = x$; or, using the values of ξ and x ,

$$\rho \cos \varphi' \sin h = x' \tau$$

h being the west hour-angle of the star at the moment in question, and τ the interval, in hours of mean time, which has elapsed since geocentric conjunction. We shall therefore have,

$$h = h_0 + \tau$$

for the hour-angle at the end of the interval τ after geocentric conjunction. In strictness, τ should here be multiplied by the factor $1 + \frac{1}{365.25}$, because the star moves a little more than 15° in an hour of mean time; but the error arising from the neglect of the factor is too small to be important, as it will affect the predicted time of conjunction by less than 10 seconds. The equation for finding τ is therefore,

$$\rho \cos \varphi' \sin (h_0 + \tau) = x' \tau$$

The quantities h_0 and x' being derived immediately from the data of the Ephemeris, the quantity τ is readily obtained by successive approximation, and may be tabulated as a function of h_0 and x' . The computation of τ is effected as follows. We have

$$\sin (h_0 + \tau) = \sin h_0 + 2 \sin \frac{1}{2} \tau \cos (h_0 + \frac{1}{2} \tau) \quad (1)$$

The value of τ in arc being seldom more than 24° we may put τ itself for $2 \sin \frac{1}{2} \tau$. The equation will then become

$$\rho \cos \varphi' \sin h_0 + \tau \rho \cos \varphi' \cos (h_0 + \frac{1}{2} \tau) = x' \tau$$

from which we find

$$\tau = \frac{\rho \cos \varphi' \sin h_0}{x' - \rho \cos \varphi' \cos (h_0 + \frac{1}{2} \tau)} \quad (2)$$

To tabulate τ , we must first have a table of the quantities

$$\begin{aligned} \xi &= \rho \cos \varphi' \sin h \\ \xi' &= [9.41916] \rho \cos \varphi' \cos h \end{aligned} \quad (3)$$

which table may be formed for every 10 minutes (in time) of h . If we then put ξ_0 for the value of ξ corresponding to $h = h_0$ and ξ'_1 for the value of ξ' corresponding to $h = h_0 + \frac{1}{2} \tau$, we shall have

$$\tau = \frac{\xi_0}{x' - \xi'_1} \quad (4)$$

Since we must know the value of τ , approximately, before we can take ξ'_1 from the table, this equation can be solved only by successive approximations. The approximations converge so rapidly as to offer no difficulty. It will be best to begin by comparing values of τ for the two extremes of x' , namely, $x' = 0.48$ and $x' = 0.60$, because the approximate values of τ can then be interpolated for all the intermediate values of x' . For the first approximation may be taken—

$$\begin{aligned} \frac{1}{2} \tau &= 50^m \sin \frac{4}{3} h_0 \quad (\text{for } x' = 0.48) \\ \frac{1}{2} \tau &= 40^m \sin \frac{4}{3} h_0 \quad (\text{for } x' = 0.60) \end{aligned} \quad (5)$$

or, the approximate values of τ may be taken from Mr. DOWNES's table, pages 444—445. It will be best to make the computation for every 30^m of h_0 , and to find the intermediate values of τ for every 10^m by interpolation. Then for each 30^m of h_0 we take ξ' from a table with the argument $h_0 + \frac{1}{2} \tau$, and $\log \xi$ with the argument h_0 , and thence compute τ by (4). If the value of τ thus arrived at differs more than 3^m from that employed in taking out ξ' , a new value may be used to correct ξ' , and the computation may be repeated. The values corresponding to $x' = 0.51$, $x' = 0.54$, and $x' = 0.57$, can then be computed with the single interpolation of approximate values of τ , and afterward the table can be extended by interpolation to every 0.01 of x' between $x' = 0.48$ and $x' = 0.60$. It will be best to compute τ in the first place to every 0.001 of an hour, and to drop the last figure in forming the definitive table. The table thus formed will be called *Table I*.

The values of η and η' may then be tabulated for every degree of the star's declination, and every 10^m of h . It is a mere question of convenience whether to compute the table for negative values of d , since by putting

$$\begin{aligned}\eta_1 &= \rho \sin \varphi' \cos d \\ \eta_2 &= -\rho \cos \varphi' \sin d \cos h\end{aligned}$$

η_1 may be given in a table of single-entry; and taking η_2 from the table of double-entry for a positive d , we shall have

$$\eta = \eta_1 \pm \eta_2$$

the lower sign being used for a negative d . But the extension of the table for η to negative values of d is so readily made that it will probably be found better to do it, so as to save taking out η_1 and η_2 separately.

This table for η will be called *Table II*, and the corresponding one for η' with the same arguments *Table III*. The precepts for using the tables will then be as follow:—

From *Table I* with the arguments x' and $H - \lambda = h_0$ take out the value of τ . It will be sufficient to use the nearest 0.01 of x' . τ will be of the same sign as h_0 . Then, enter *Table II* with the arguments d (the star's declination) and $h = h_0 + \tau$, and take out the value of η . Form the quantities $y = Y + y' \tau$, and $y - \eta$. If the latter quantity lies between the limits ± 0.28 , it is almost certain that there will be an occultation. If it falls without the limits ± 0.33 , it is almost certain that there will not be an occultation. Between the years 1881 and 1891 these last limits may be reduced to ± 0.32 , and cases near this limit may be rejected if y' is small. A convenient rule to adopt will be—

$$\begin{aligned}y' < 0.10, & \quad = \pm 0.29 \\ 0.10 < y' < 0.15, & \quad = \pm 0.30 \\ 0.15 < y' < 0.20, & \quad = \pm 0.31 \\ 0.20 < y' & \quad = \pm 0.33 \text{ or } \pm 0.32\end{aligned}$$

Here, only the absolute value of y' is to be considered, without respect to its algebraic sign.

If $y - \eta$ falls between the limits thus indicated, take the values of ξ' and η' from the appropriate tables and compute v , Q and Δ from the equations

$$\begin{aligned}v \sin Q &= y' - \eta' \\ v \cos Q &= x' - \xi' \\ \Delta &= (y - \eta) \cos Q\end{aligned}$$

If $\Delta > 0.2723$ or $\log \Delta > 9.4350$ there will be no occultation, though the moon may graze the star when $\Delta = 0.2723$ is very small. If $\Delta < 0.2723$, compute

$$\begin{aligned}\tau_1 &= -\frac{y - \eta}{v} \sin Q & \cos P &= \frac{\Delta}{0.2723} \quad (P < 180^\circ) \\ \tau_2 &= \frac{0.2723 \sin P}{v}\end{aligned}$$

We shall then have—

$$\text{Local mean time of immersion, } T - \lambda + \tau + \tau_1 - \tau_2$$

$$\text{Local mean time of emersion, } T - \lambda + \tau + \tau_1 + \tau_2$$

$$\text{Position-angle from north toward east at immersion, } 180^\circ - Q - P$$

$$\text{Position-angle from north toward east at emersion, } 180^\circ - Q + P$$

In predicting the occultations for a given place, the first operation will be to go over the list of occultations in the *Ephemeris*, and select those which may be visible. The conditions of possible visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H - \lambda$, taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east horizon, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The sun must not be much more than an hour above the horizon at the local mean time $T - \lambda$, unless the star is bright enough to be seen in the day time.

The most convenient course will be to write the value of $-\lambda$ on the bottom of a sheet of paper, and, passing through the list of occultations, pause over each one for which condition (1) is fulfilled, and examine whether conditions (2) and (3) are fulfilled. If either fails, the computer passes on. Very often it will require some examination to find whether $H - \lambda$ or $T - \lambda$ falls within the limits; in these cases, the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

Phenomena of Planets and Satellites, pages 446—479.—These are, for the most part, sufficiently explained in the body of the work. The following additional explanations are added for completeness.

Disks of Mercury and Venus, pages 446—447.—The angle θ , needed in reducing meridian observations, is the angle which the arc of the great circle from the planet to the sun, makes with the arc from the planet toward the west, reckoned in the direction west, north, east, south. This position-angle is reckoned from 0° to 360° , as in the measurement of double stars, the planet taking the place of the central star. But its measure is 90° greater than that of a double star.

We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Satellites of Jupiter, pages 449—473.—The times of phenomena are explained at the foot of each page; the diagram is on page 449.

Phenomena, pages 480—481.—The conjunctions, quadratures, and oppositions of the planets with respect to the sun, give the hours when the longitude of each planet differs from that of the sun by 0° , 90° or 180° .

The conjunctions of the moon and planets with each other are given in right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

Latitude by Observed Altitude of Polaris.—Table IV replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the Ephemeris for 1874—1881, and is intended for use at sea and reconnaissance on land. It will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

The directions for using the table are adapted to a right ascension of Polaris equal to $1^h 18^m.9$. Somewhat greater accuracy may be insured by substituting the right ascension of Polaris at the date of observation, from pages 302—313 of this volume.

APPENDIX.

ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1891.

THE adopted constants of precession, nutation, and aberration are those of STRUVE and PETERS, namely:—

$$\text{Precession} = 50''.2411 + 0''.0002268 t$$

$$\text{Nutation} = 9''.2231 + 0''.000009 t$$

$$\text{Aberration} = 20''.4451$$

in which t is the number of years after 1800.0.

The obliquity of the ecliptic is that of HANSEN's *Tables du Soleil*, which is $0''.31$ greater than that of PETERS, given in the issues of this Ephemeris preceding that for 1882. A comparison of HANSEN's mean obliquity with that of PETERS and of LE VERRIER at different epochs is given in the following table:—

| Epoch. | HANSEN. | | | PETERS. | LE VERRIER. | H.—P. | H.—L. |
|--------|---------|----|-------|---------|-------------|--------|--------|
| | ° | ' | " | " | " | + | — |
| 1750 | 23 | 28 | 18.19 | 17.44 | 19.42 | + 0.75 | — 1.23 |
| 1800 | 23 | 27 | 54.80 | 54.22 | 55.63 | + 0.58 | — 0.83 |
| 1850 | 23 | 27 | 31.42 | 30.99 | 31.83 | + 0.43 | — 0.41 |
| 1900 | 23 | 27 | 8.02 | 7.76 | 8.03 | + 0.26 | — 0.01 |

The formulæ for reducing the places of the fixed stars, page 230, correspond to the *Star Tables of the American Ephemeris*, Washington, 1869.

The mean right ascensions of stars have been reduced to NEWCOMB's fundamental standard in the catalogue attached to the *Washington Observations for 1870*, Appendix II, with the following exceptions: The right ascensions of the 48 circumpolar stars north of 60° north declination are from Dr. GOULD's *Standard Places of Fundamental Stars*, second edition, United States Coast Survey Office, 1866. Of the twelve stars south of 50° south declination, the positions of β Hydri, α Trianguli Australis, and σ Octantis, have been corrected from data furnished by Dr. GOULD; while the remaining nine are, as before, from the *British Nautical Almanac* for 1848.

The right ascensions of the additional stars in the general list, whose apparent right ascensions are given in a subsequent section, have been taken partly from the *Catalogue of 1098 Standard Clock and Zodiacal Stars*, forming Part IV of Vol. I of *Astronomical Papers Prepared for the Use of the American Ephemeris and Nautical Almanac*, Washington, 1881; and partly from the catalogue of the Astronomische Gesellschaft of 1878. A few have been derived from recent catalogues without a rigorous reduction for equinox.

The mean declinations of stars are taken from BOSS's paper in the *Report of the Northern Boundary Commission*, Washington, 1879, for all stars found therein. The declinations of all the other stars have been reduced to the same standard, except those of the additional ones above, which have been taken partly from the Astronomische Gesellschaft list, and partly from places in recent catalogues. To the apparent places of Sirius and Procyon have been applied the periodic corrections resulting from AUWERS's investigations.

The values of these corrections are:—

| Year. | Sirius. | | Procyon. | |
|--------|---------------------------|--------------------------|---------------------------|--------------------------|
| 1891.0 | $\Delta \alpha = + 0.133$ | $\Delta \delta = - 0.14$ | $\Delta \alpha = + 0.053$ | $\Delta \delta = + 0.69$ |
| 1892.0 | $\Delta \alpha = + 0.148$ | $\Delta \delta = + 0.28$ | $\Delta \alpha = + 0.060$ | $\Delta \delta = + 0.55$ |

The ephemeris of the sun is constructed from HANSEN and OLUFSEN's *Tables du Soleil*, Copenhagen, 1853, except that STRUVE's aberration has been used. This is equivalent to adding $0''.19$ to the true longitudes, but it does not affect the right ascensions and declinations. The sun's rectangular equatorial co-ordinates have been computed from the longitudes and latitudes by the following formulæ:—

$$\begin{aligned} X &= R \cos \lambda \\ Y &= R \sin \lambda \cos \omega - 19.3 R \beta \\ Z &= R \sin \lambda \sin \omega + 44.5 R \beta \end{aligned}$$

The reductions to mean equinox, 1891.0, are computed by the formulæ,

$$\begin{aligned} \Delta X' &= + Y \sec \omega \Delta \lambda \sin 1'' \\ \Delta Y' &= - X \cos \omega \Delta \lambda \sin 1'' + Z \Delta \omega \sin 1'' - 9.4 \tau R \sin (\lambda + 187^\circ) \\ \Delta Z' &= - X \sin \omega \Delta \lambda \sin 1'' - Y \Delta \omega \sin 1'' + 21.7 \tau R \sin (\lambda + 187^\circ) \end{aligned}$$

Wherein—

- λ and β are the longitude and latitude of the sun referred to the equinox and ecliptic of the date;
- ω , the obliquity of the ecliptic;
- $\Delta \lambda$, the reduction of longitude for precession and nutation from January 0;
- $\Delta \omega$, the reduction of the mean to the apparent obliquity;
- τ , the fraction of the year since January 0.

The numerical coefficients are in units of the seventh place of decimals. The correction for latitude has been taken from GOETZE's paper in the *Astronomical Journal*, Vol. II, page 71.

The mean equatorial horizontal parallax of the sun, adopted from Professor NEWCOMB's *Investigation of the Distance of the Sun and the Elements which depend on it*,* is $8''.848$. The adopted semidiameter of the sun at the earth's mean distance is $16' 2''$. In the computations pertaining to eclipses, BESSEL's semidiameter, $15' 59''.788$ has been used.

The right ascension, declination and parallax of the moon are derived from HANSEN's *Tables de la Lune*, London, 1857, the mean longitude being corrected in accordance with NEWCOMB's *Researches on the Motion of the Moon*, Part I, page 268,† and a corrected table being substituted for Table XXXIV.

The semidiameter of the moon is computed from the moon's horizontal parallax by the formula,

$$S = 0.272274 \pi + 2''.5$$

The constant $2''.5$ is omitted in the computation of eclipses and occultations, as due entirely to telescopic and ocular irradiation.

The ephemeris of Mercury is derived from Professor WINLOCK's *Tables of Mercury*, Washington, 1864. They are based on the older theory of LE VERRIER, published in the *Additions to the Connaissance des Temps* for 1848.

The ephemeris of Venus is derived from Mr. G. W. HILL's *Tables of Venus*, Washington, 1872.

The ephemeris of Mars is derived from manuscript tables constructed from LINDENAU's *Tables of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX, have also been discussed and applied; and LE VERRIER's secular variations of the elements are likewise adopted. The perturbations produced by Jupiter have been increased by $\frac{1}{10}$ of their value. The following are the corresponding corrected elements and annual variations for Washington, 1855.0:—

$$\begin{aligned} L &= 320^\circ 13' 33''.87 + 689101''.1527 \ t \\ \pi &= 333 \ 23 \ 17.84 + 65.9990 \ t \\ Q &= 48 \ 25 \ 55.29 + 27.6997 \ t \\ i &= 1 \ 51 \ 2.20 - 0.02141 \ t \\ e &= 19238''.75 + 0.18549 \ t \\ n &= 689050''.8927 \\ a &= 1.5236915 \end{aligned}$$

The ephemeris of Jupiter is derived from manuscript tables constructed from BOUVARD's *Tables*, with such changes as were required to make them correspond more nearly to the formulæ.

The ephemeris of Saturn is derived from a provisional theory constructed by Mr. GEORGE W. HILL, and still unpublished.

The ephemerides of Uranus and Neptune are derived from Professor NEWCOMB's *Tables*, published by the *Smithsonian Institution*.

* *Astronomical Observations made at the U. S. Naval Observatory, Washington, 1865, Appendix II.*

† *Astronomical Observations made at the U. S. Naval Observatory, Washington, 1875, Appendix II*

The semidiameters of the planets are computed from the following values:—

| | Semidiameter. | Log Dist. | Authority. |
|----------------------|-------------------|-----------|--|
| Mercury | 3.34 " | 0.00 | LE VERRIER, <i>Theory of Mercury</i> . |
| Venus | 8.546 \pm 0.086 | 0.00 | PEIRCE, from the Washington Observations of 1845 and 1846, made with the Mural Circle. |
| Mars | 2.842 \pm 0.057 | 0.25 | |
| Jupiter (polar) | 18.78 \pm 0.067 | 0.70 | |
| Saturn (polar) | 8.77 \pm 0.039 | 0.95 | |
| Uranus | 1.68 \pm 0.3 | 1.30 | |
| Neptune | 1.28 | 1.48 | |
| Jupiter (equatorial) | 20.00 | 0.70 | |
| Saturn (equatorial) | 9.38 | 0.95 | |

The elements of eclipses of the sun and occultations of stars by the moon are adapted to BESSEL's method, using the special forms in CHAUVENET's *Spherical and Practical Astronomy*. The adopted semidiameters are:—

| | |
|--|----------|
| Semidiameter of the sun at distance unity . . . | 959".788 |
| Ratio of radius of moon to radius of earth . . . | 0.27227 |

The eclipses of Jupiter's satellites are computed from TODD's *Continuation of DAMOISEAU's Tables* Washington, 1876. The occultations, transits, etc., are computed from WOOLHOUSE's *Tables, British Nautical Almanac* for 1835, Table II of each satellite having been adapted to DAMOISEAU's *Tables*.

The elongations and conjunctions of the satellites of Saturn are computed from manuscript tables prepared by Professor NEWCOMB, except those of Titan, Hyperion, and Iapetus.

The apparent elements of the rings of Saturn are computed from BESSEL's data, except those for the dusky ring.

The elongations of the satellites of Uranus, and of the satellite of Neptune are computed from the data of Professor NEWCOMB's *Uranian and Neptunian Systems*, Washington, 1875.

In compiling the positions of observatories, the latest available data have been used. The positions have been furnished, in many instances, through the courtesy of the directors of the Observatories, in response to a circular issued by the Superintendent of the American Ephemeris.

The reduction to geocentric latitude, and the logarithm of the radius of the earth, are derived from BESSEL's elements of the terrestrial spheroid, as adopted in Table III of CHAUVENET's *Spherical and Practical Astronomy*, Vol. II:—

$$\begin{aligned}\log e &= 8.9122052 \\ \varphi' - \varphi &= -11' 30''.65 \sin 2 \varphi + 1''.16 \sin 4 \varphi \\ \log \rho &= 9.9992747 + 0.0007271 \cos 2 \varphi - 0.0000018 \cos 4 \varphi\end{aligned}$$

Table IV, for finding the latitude from an observed altitude of Polaris, is constructed for—

- (1) An altitude of Polaris equal to 45°.
- (2) A declination of Polaris equal to + 88° 43'.

The principal computations of the Ephemeris have been distributed in the following manner:—

The ephemeris of the Sun was computed by the late Mr. EASTWOOD; the Moon's longitude, latitude, semidiameter and horizontal parallax, by Professor KEITH; the right ascension and declination, by Professor VAN VLECK; the culminations, by Mr. LOOMIS and Mr. MEIER; the lunar distances, by Mr. BRADFORD; Mercury and Venus, by Mr. E. P. AUSTIN; Mars, Jupiter, Saturn, Uranus, and Neptune, by Mr. ROBERT DEAU BUCHANAN; Jupiter's satellites, by Professor H. D. TODD; the satellites of Saturn, Uranus, and Neptune, by Dr. MORRISON. The mean and apparent places of the fixed stars were prepared by Mr. MEIER and Mr. HEDRICK; the general constants for their reduction, by Mr. BUCHANAN; the occultations, by Mr. J. O. WIESSNER; and the eclipses were computed and the charts projected by Mr. BUCHANAN.

TABLE I.

CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

| Approximate Interval. | | | | DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|------|-----|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|-----|----|----|--|--|
| | | | | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 44 | 46 | 48 | 50 | 52 | | |
| h | m | h | m | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | | | |
| 0 0 | 3 0 | 0 0 | 0 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 0 10 | 2 50 | 0 0 | 0 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | |
| 0 20 | 2 40 | 0 0 | 0 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | | | |
| 0 30 | 2 30 | 0 1 | 1 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 5 | 5 | 5 | 6 | 6 | 6 | 7 | 7 | 7 | 8 | 8 | 8 | 9 | | | |
| 0 40 | 2 20 | 0 1 | 1 1 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 6 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 10 | 11 | 11 | | | |
| 0 50 | 2 10 | 1 1 | 1 2 | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 10 | 11 | 11 | 12 | 12 | 13 | 13 | | | |
| 1 0 | 2 0 | 1 1 | 1 2 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 10 | 11 | 12 | 12 | 13 | 13 | 14 | 14 | 14 | | | |
| 1 10 | 1 50 | 1 1 | 1 2 | 2 | 2 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 11 | 11 | 12 | 12 | 13 | 14 | 14 | 15 | 15 | | | |
| 1 20 | 1 40 | 1 1 | 1 2 | 3 | 3 | 4 | 4 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 10 | 11 | 12 | 12 | 13 | 14 | 14 | 15 | 16 | 16 | 16 | | | |
| 1 30 | 1 30 | 1 1 | 1 2 | 3 | 3 | 4 | 4 | 5 | 6 | 6 | 7 | 8 | 8 | 9 | 9 | 10 | 11 | 11 | 12 | 12 | 13 | 14 | 14 | 15 | 16 | 16 | 17 | 17 | | | |
| | | | | DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 54 | 56 | 58 | 60 | 62 | 64 | 66 | 68 | 70 | 72 | 74 | 76 | 78 | 80 | 82 | 84 | 86 | 88 | 90 | 92 | 94 | 96 | 98 | 100 | | | | |
| h | m | h | m | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | | | |
| 0 0 | 3 0 | 0 0 | 0 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 0 10 | 2 50 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | | | | |
| 0 20 | 2 40 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | | | |
| 0 30 | 2 30 | 9 | 10 | 10 | 10 | 11 | 11 | 12 | 12 | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 17 | | | |
| 0 40 | 2 20 | 12 | 12 | 13 | 13 | 13 | 14 | 14 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 18 | 18 | 19 | 19 | 19 | 20 | 20 | 21 | 21 | 22 | 22 | 22 | | | |
| 0 50 | 2 10 | 14 | 14 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 18 | 19 | 19 | 19 | 20 | 20 | 21 | 21 | 22 | 22 | 22 | 23 | 23 | 24 | 24 | 25 | 25 | 25 | | | |
| 1 0 | 2 0 | 15 | 16 | 16 | 17 | 17 | 18 | 18 | 19 | 19 | 20 | 21 | 21 | 22 | 22 | 23 | 23 | 24 | 24 | 25 | 25 | 26 | 26 | 27 | 27 | 28 | 28 | 28 | | | |
| 1 10 | 1 50 | 16 | 17 | 17 | 18 | 18 | 19 | 19 | 20 | 20 | 21 | 21 | 22 | 22 | 23 | 24 | 24 | 25 | 25 | 26 | 27 | 27 | 28 | 28 | 29 | 30 | 30 | 30 | | | |
| 1 20 | 1 40 | 17 | 17 | 18 | 19 | 19 | 20 | 20 | 21 | 21 | 22 | 23 | 23 | 24 | 25 | 25 | 26 | 26 | 27 | 28 | 28 | 29 | 30 | 31 | 31 | 32 | 32 | 32 | | | |
| 1 30 | 1 30 | 17 | 18 | 18 | 19 | 19 | 20 | 21 | 21 | 22 | 23 | 23 | 24 | 24 | 25 | 25 | 26 | 27 | 27 | 28 | 29 | 30 | 31 | 31 | 32 | 33 | 33 | 33 | | | |
| | | | | DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 102 | 104 | 106 | 108 | 110 | 112 | 114 | 116 | 118 | 120 | 122 | 124 | 126 | 128 | 130 | 132 | 134 | 136 | 138 | | | | | | | | | |
| h | m | h | m | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | s | | | | | | | | | | | |
| 0 0 | 3 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | |
| 0 10 | 2 50 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | | | | | | | | | | | |
| 0 20 | 2 40 | 13 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | | | | | | | | | | | |
| 0 30 | 2 30 | 18 | 18 | 18 | 19 | 19 | 19 | 19 | 20 | 20 | 20 | 21 | 21 | 21 | 21 | 22 | 22 | 22 | 23 | 23 | | | | | | | | | | | |
| 0 40 | 2 20 | 22 | 22 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | 25 | 26 | 26 | 26 | 27 | 27 | 27 | 28 | 28 | 29 | | | | | | | | | | | |
| 0 50 | 2 10 | 26 | 26 | 26 | 27 | 27 | 28 | 28 | 29 | 29 | 29 | 30 | 30 | 30 | 31 | 31 | 32 | 32 | 33 | 33 | | | | | | | | | | | |
| 1 0 | 2 0 | 28 | 29 | 29 | 30 | 30 | 31 | 31 | 32 | 33 | 33 | 34 | 34 | 34 | 35 | 35 | 36 | 36 | 37 | 37 | | | | | | | | | | | |
| 1 10 | 1 50 | 30 | 31 | 31 | 32 | 32 | 33 | 34 | 34 | 35 | 35 | 36 | 36 | 37 | 37 | 38 | 38 | 39 | 39 | 40 | | | | | | | | | | | |
| 1 20 | 1 40 | 31 | 32 | 33 | 33 | 34 | 34 | 35 | 35 | 36 | 36 | 37 | 38 | 38 | 39 | 39 | 40 | 40 | 41 | 41 | | | | | | | | | | | |
| 1 30 | 1 30 | 32 | 32 | 33 | 34 | 34 | 35 | 35 | 36 | 36 | 37 | 38 | 38 | 39 | 39 | 40 | 40 | 41 | 42 | 42 | | | | | | | | | | | |

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

| TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL. | | | | | | | | | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------------|
| Sidereal. | 0 ^h . | 1 ^h . | 2 ^h . | 3 ^h . | 4 ^h . | 5 ^h . | 6 ^h . | 7 ^h . | For Seconds. |
| m | m | m | m | m | m | m | m | m | s |
| 0 | 0 0.000 | 0 9.830 | 0 19.659 | 0 29.489 | 0 39.318 | 0 49.148 | 0 58.977 | 1 8.807 | 0 0.000 |
| 1 | 0 0.164 | 0 9.993 | 0 19.823 | 0 29.653 | 0 39.482 | 0 49.312 | 0 59.141 | 1 8.971 | 1 0.003 |
| 2 | 0 0.328 | 0 10.157 | 0 19.987 | 0 29.816 | 0 39.646 | 0 49.475 | 0 59.305 | 1 9.135 | 2 0.005 |
| 3 | 0 0.491 | 0 10.321 | 0 20.151 | 0 29.980 | 0 39.810 | 0 49.639 | 0 59.469 | 1 9.298 | 3 0.008 |
| 4 | 0 0.655 | 0 10.485 | 0 20.314 | 0 30.144 | 0 39.974 | 0 49.803 | 0 59.633 | 1 9.462 | 4 0.011 |
| 5 | 0 0.819 | 0 10.649 | 0 20.478 | 0 30.308 | 0 40.137 | 0 49.967 | 0 59.796 | 1 9.626 | 5 0.014 |
| 6 | 0 0.983 | 0 10.813 | 0 20.642 | 0 30.472 | 0 40.301 | 0 50.131 | 0 59.960 | 1 9.790 | 6 0.016 |
| 7 | 0 1.147 | 0 10.976 | 0 20.806 | 0 30.635 | 0 40.465 | 0 50.295 | 1 0.124 | 1 9.954 | 7 0.019 |
| 8 | 0 1.311 | 0 11.140 | 0 20.970 | 0 30.799 | 0 40.629 | 0 50.458 | 1 0.288 | 1 10.118 | 8 0.022 |
| 9 | 0 1.474 | 0 11.304 | 0 21.134 | 0 30.963 | 0 40.793 | 0 50.622 | 1 0.452 | 1 10.281 | 9 0.025 |
| 10 | 0 1.638 | 0 11.468 | 0 21.297 | 0 31.127 | 0 40.956 | 0 50.786 | 1 0.616 | 1 10.445 | 10 0.027 |
| 11 | 0 1.802 | 0 11.632 | 0 21.461 | 0 31.291 | 0 41.120 | 0 50.950 | 1 0.779 | 1 10.609 | 11 0.030 |
| 12 | 0 1.966 | 0 11.795 | 0 21.625 | 0 31.455 | 0 41.284 | 0 51.114 | 1 0.943 | 1 10.773 | 12 0.033 |
| 13 | 0 2.130 | 0 11.959 | 0 21.789 | 0 31.618 | 0 41.448 | 0 51.278 | 1 1.107 | 1 10.937 | 13 0.035 |
| 14 | 0 2.294 | 0 12.123 | 0 21.953 | 0 31.782 | 0 41.612 | 0 51.441 | 1 1.271 | 1 11.100 | 14 0.038 |
| 15 | 0 2.457 | 0 12.287 | 0 22.117 | 0 31.946 | 0 41.776 | 0 51.605 | 1 1.435 | 1 11.264 | 15 0.041 |
| 16 | 0 2.621 | 0 12.451 | 0 22.280 | 0 32.110 | 0 41.939 | 0 51.769 | 1 1.599 | 1 11.428 | 16 0.044 |
| 17 | 0 2.785 | 0 12.615 | 0 22.444 | 0 32.274 | 0 42.103 | 0 51.933 | 1 1.762 | 1 11.592 | 17 0.046 |
| 18 | 0 2.949 | 0 12.778 | 0 22.608 | 0 32.438 | 0 42.267 | 0 52.097 | 1 1.926 | 1 11.756 | 18 0.049 |
| 19 | 0 3.113 | 0 12.942 | 0 22.772 | 0 32.601 | 0 42.431 | 0 52.260 | 1 2.090 | 1 11.920 | 19 0.052 |
| 20 | 0 3.277 | 0 13.106 | 0 22.936 | 0 32.765 | 0 42.595 | 0 52.424 | 1 2.254 | 1 12.083 | 20 0.055 |
| 21 | 0 3.440 | 0 13.270 | 0 23.099 | 0 32.929 | 0 42.759 | 0 52.588 | 1 2.418 | 1 12.247 | 21 0.057 |
| 22 | 0 3.604 | 0 13.434 | 0 23.263 | 0 33.093 | 0 42.922 | 0 52.752 | 1 2.582 | 1 12.411 | 22 0.060 |
| 23 | 0 3.768 | 0 13.598 | 0 23.427 | 0 33.257 | 0 43.086 | 0 52.916 | 1 2.745 | 1 12.575 | 23 0.063 |
| 24 | 0 3.932 | 0 13.761 | 0 23.591 | 0 33.420 | 0 43.250 | 0 53.080 | 1 2.909 | 1 12.739 | 24 0.066 |
| 25 | 0 4.096 | 0 13.925 | 0 23.755 | 0 33.584 | 0 43.414 | 0 53.243 | 1 3.073 | 1 12.903 | 25 0.068 |
| 26 | 0 4.259 | 0 14.089 | 0 23.919 | 0 33.748 | 0 43.578 | 0 53.407 | 1 3.237 | 1 13.066 | 26 0.071 |
| 27 | 0 4.423 | 0 14.253 | 0 24.082 | 0 33.912 | 0 43.742 | 0 53.571 | 1 3.401 | 1 13.230 | 27 0.074 |
| 28 | 0 4.587 | 0 14.417 | 0 24.246 | 0 34.076 | 0 43.905 | 0 53.735 | 1 3.564 | 1 13.394 | 28 0.076 |
| 29 | 0 4.751 | 0 14.581 | 0 24.410 | 0 34.240 | 0 44.069 | 0 53.899 | 1 3.728 | 1 13.558 | 29 0.079 |
| 30 | 0 4.915 | 0 14.744 | 0 24.574 | 0 34.403 | 0 44.233 | 0 54.063 | 1 3.892 | 1 13.722 | 30 0.082 |
| 31 | 0 5.079 | 0 14.908 | 0 24.738 | 0 34.567 | 0 44.397 | 0 54.226 | 1 4.056 | 1 13.886 | 31 0.085 |
| 32 | 0 5.242 | 0 15.072 | 0 24.902 | 0 34.731 | 0 44.561 | 0 54.390 | 1 4.220 | 1 14.049 | 32 0.087 |
| 33 | 0 5.406 | 0 15.236 | 0 25.065 | 0 34.895 | 0 44.724 | 0 54.554 | 1 4.384 | 1 14.213 | 33 0.090 |
| 34 | 0 5.570 | 0 15.400 | 0 25.229 | 0 35.059 | 0 44.888 | 0 54.718 | 1 4.547 | 1 14.377 | 34 0.093 |
| 35 | 0 5.734 | 0 15.563 | 0 25.393 | 0 35.223 | 0 45.052 | 0 54.882 | 1 4.711 | 1 14.541 | 35 0.096 |
| 36 | 0 5.898 | 0 15.727 | 0 25.557 | 0 35.386 | 0 45.216 | 0 55.046 | 1 4.875 | 1 14.705 | 36 0.098 |
| 37 | 0 6.062 | 0 15.891 | 0 25.721 | 0 35.550 | 0 45.380 | 0 55.209 | 1 5.039 | 1 14.868 | 37 0.101 |
| 38 | 0 6.225 | 0 16.055 | 0 25.885 | 0 35.714 | 0 45.544 | 0 55.373 | 1 5.203 | 1 15.032 | 38 0.104 |
| 39 | 0 6.389 | 0 16.219 | 0 26.048 | 0 35.878 | 0 45.707 | 0 55.537 | 1 5.367 | 1 15.196 | 39 0.106 |
| 40 | 0 6.553 | 0 16.383 | 0 26.212 | 0 36.042 | 0 45.871 | 0 55.701 | 1 5.530 | 1 15.360 | 40 0.109 |
| 41 | 0 6.717 | 0 16.546 | 0 26.376 | 0 36.206 | 0 46.035 | 0 55.865 | 1 5.694 | 1 15.524 | 41 0.112 |
| 42 | 0 6.881 | 0 16.710 | 0 26.540 | 0 36.369 | 0 46.199 | 0 56.028 | 1 5.858 | 1 15.688 | 42 0.115 |
| 43 | 0 7.045 | 0 16.874 | 0 26.704 | 0 36.533 | 0 46.363 | 0 56.192 | 1 6.022 | 1 15.851 | 43 0.117 |
| 44 | 0 7.208 | 0 17.038 | 0 26.867 | 0 36.697 | 0 46.527 | 0 56.356 | 1 6.186 | 1 16.015 | 44 0.120 |
| 45 | 0 7.372 | 0 17.202 | 0 27.031 | 0 36.861 | 0 46.690 | 0 56.520 | 1 6.350 | 1 16.179 | 45 0.123 |
| 46 | 0 7.536 | 0 17.366 | 0 27.195 | 0 37.025 | 0 46.854 | 0 56.684 | 1 6.513 | 1 16.343 | 46 0.126 |
| 47 | 0 7.700 | 0 17.529 | 0 27.359 | 0 37.188 | 0 47.018 | 0 56.848 | 1 6.677 | 1 16.507 | 47 0.128 |
| 48 | 0 7.864 | 0 17.693 | 0 27.523 | 0 37.352 | 0 47.182 | 0 57.011 | 1 6.841 | 1 16.671 | 48 0.131 |
| 49 | 0 8.027 | 0 17.857 | 0 27.687 | 0 37.516 | 0 47.346 | 0 57.175 | 1 7.005 | 1 16.834 | 49 0.134 |
| 50 | 0 8.191 | 0 18.021 | 0 27.850 | 0 37.680 | 0 47.510 | 0 57.339 | 1 7.169 | 1 16.998 | 50 0.137 |
| 51 | 0 8.355 | 0 18.185 | 0 28.014 | 0 37.844 | 0 47.673 | 0 57.503 | 1 7.332 | 1 17.162 | 51 0.139 |
| 52 | 0 8.519 | 0 18.349 | 0 28.178 | 0 38.008 | 0 47.837 | 0 57.667 | 1 7.496 | 1 17.326 | 52 0.142 |
| 53 | 0 8.683 | 0 18.512 | 0 28.342 | 0 38.171 | 0 48.001 | 0 57.831 | 1 7.660 | 1 17.490 | 53 0.145 |
| 54 | 0 8.847 | 0 18.676 | 0 28.506 | 0 38.335 | 0 48.165 | 0 57.994 | 1 7.824 | 1 17.654 | 54 0.147 |
| 55 | 0 9.010 | 0 18.840 | 0 28.670 | 0 38.499 | 0 48.329 | 0 58.158 | 1 7.988 | 1 17.817 | 55 0.150 |
| 56 | 0 9.174 | 0 19.004 | 0 28.833 | 0 38.663 | 0 48.492 | 0 58.322 | 1 8.152 | 1 17.981 | 56 0.153 |
| 57 | 0 9.338 | 0 19.168 | 0 28.997 | 0 38.827 | 0 48.656 | 0 58.486 | 1 8.315 | 1 18.145 | 57 0.156 |
| 58 | 0 9.502 | 0 19.331 | 0 29.161 | 0 38.991 | 0 48.820 | 0 58.650 | 1 8.479 | 1 18.309 | 58 0.158 |
| 59 | 0 9.666 | 0 19.495 | 0 29.325 | 0 39.154 | 0 48.984 | 0 58.814 | 1 8.643 | 1 18.473 | 59 0.161 |
| Sidereal. | 0 ^h . | 1 ^h . | 2 ^h . | 3 ^h . | 4 ^h . | 5 ^h . | 6 ^h . | 7 ^h . | For Seconds. |

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

| TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL. | | | | | | | | | |
|---|------------------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------|
| Sidereal. | 8 ^h . | 9 ^h . | 10 ^h . | 11 ^h . | 12 ^h . | 13 ^h . | 14 ^h . | 15 ^h . | For Seconds. |
| 0 | 1 18.636 | 1 28.466 | 1 38.296 | 1 48.125 | 1 57.955 | 2 7.784 | 2 17.614 | 2 27.443 | 0 0.000 |
| 1 | 1 18.800 | 1 28.630 | 1 38.459 | 1 48.289 | 1 58.119 | 2 7.948 | 2 17.778 | 2 27.607 | 1 0.003 |
| 2 | 1 18.964 | 1 28.794 | 1 38.623 | 1 48.453 | 1 58.282 | 2 8.112 | 2 17.941 | 2 27.771 | 2 0.005 |
| 3 | 1 19.128 | 1 28.958 | 1 38.787 | 1 48.617 | 1 58.446 | 2 8.276 | 2 18.105 | 2 27.935 | 3 0.008 |
| 4 | 1 19.292 | 1 29.121 | 1 38.951 | 1 48.780 | 1 58.610 | 2 8.440 | 2 18.269 | 2 28.099 | 4 0.011 |
| 5 | 1 19.456 | 1 29.285 | 1 39.115 | 1 48.944 | 1 58.774 | 2 8.603 | 2 18.433 | 2 28.263 | 5 0.014 |
| 6 | 1 19.619 | 1 29.449 | 1 39.279 | 1 49.108 | 1 58.938 | 2 8.767 | 2 18.597 | 2 28.426 | 6 0.016 |
| 7 | 1 19.783 | 1 29.613 | 1 39.442 | 1 49.272 | 1 59.101 | 2 8.931 | 2 18.761 | 2 28.590 | 7 0.019 |
| 8 | 1 19.947 | 1 29.777 | 1 39.606 | 1 49.436 | 1 59.265 | 2 9.095 | 2 18.924 | 2 28.754 | 8 0.022 |
| 9 | 1 20.111 | 1 29.940 | 1 39.770 | 1 49.600 | 1 59.429 | 2 9.259 | 2 19.088 | 2 28.918 | 9 0.025 |
| 10 | 1 20.275 | 1 30.104 | 1 39.934 | 1 49.763 | 1 59.593 | 2 9.423 | 2 19.252 | 2 29.082 | 10 0.027 |
| 11 | 1 20.439 | 1 30.268 | 1 40.098 | 1 49.927 | 1 59.757 | 2 9.586 | 2 19.416 | 2 29.245 | 11 0.030 |
| 12 | 1 20.602 | 1 30.432 | 1 40.261 | 1 50.091 | 1 59.921 | 2 9.750 | 2 19.580 | 2 29.409 | 12 0.033 |
| 13 | 1 20.766 | 1 30.596 | 1 40.425 | 1 50.255 | 2 0.084 | 2 9.914 | 2 19.744 | 2 29.573 | 13 0.035 |
| 14 | 1 20.930 | 1 30.760 | 1 40.589 | 1 50.419 | 2 0.248 | 2 10.078 | 2 19.907 | 2 29.737 | 14 0.038 |
| 15 | 1 21.094 | 1 30.923 | 1 40.753 | 1 50.583 | 2 0.412 | 2 10.242 | 2 20.071 | 2 29.901 | 15 0.041 |
| 16 | 1 21.258 | 1 31.087 | 1 40.917 | 1 50.746 | 2 0.576 | 2 10.405 | 2 20.235 | 2 30.065 | 16 0.044 |
| 17 | 1 21.422 | 1 31.251 | 1 41.081 | 1 50.910 | 2 0.740 | 2 10.569 | 2 20.399 | 2 30.228 | 17 0.046 |
| 18 | 1 21.585 | 1 31.415 | 1 41.244 | 1 51.074 | 2 0.904 | 2 10.733 | 2 20.563 | 2 30.392 | 18 0.049 |
| 19 | 1 21.749 | 1 31.579 | 1 41.408 | 1 51.238 | 2 1.067 | 2 10.897 | 2 20.727 | 2 30.556 | 19 0.052 |
| 20 | 1 21.913 | 1 31.743 | 1 41.572 | 1 51.402 | 2 1.231 | 2 11.061 | 2 20.890 | 2 30.720 | 20 0.055 |
| 21 | 1 22.077 | 1 31.906 | 1 41.736 | 1 51.565 | 2 1.395 | 2 11.225 | 2 21.054 | 2 30.884 | 21 0.057 |
| 22 | 1 22.241 | 1 32.070 | 1 41.900 | 1 51.729 | 2 1.559 | 2 11.388 | 2 21.218 | 2 31.048 | 22 0.060 |
| 23 | 1 22.404 | 1 32.234 | 1 42.064 | 1 51.893 | 2 1.723 | 2 11.552 | 2 21.382 | 2 31.211 | 23 0.063 |
| 24 | 1 22.568 | 1 32.398 | 1 42.227 | 1 52.057 | 2 1.887 | 2 11.716 | 2 21.546 | 2 31.375 | 24 0.066 |
| 25 | 1 22.732 | 1 32.562 | 1 42.391 | 1 52.221 | 2 2.050 | 2 11.880 | 2 21.709 | 2 31.539 | 25 0.068 |
| 26 | 1 22.896 | 1 32.726 | 1 42.555 | 1 52.385 | 2 2.214 | 2 12.044 | 2 21.873 | 2 31.703 | 26 0.071 |
| 27 | 1 23.060 | 1 32.889 | 1 42.719 | 1 52.548 | 2 2.378 | 2 12.208 | 2 22.037 | 2 31.867 | 27 0.074 |
| 28 | 1 23.224 | 1 33.053 | 1 42.883 | 1 52.712 | 2 2.542 | 2 12.371 | 2 22.201 | 2 32.031 | 28 0.076 |
| 29 | 1 23.387 | 1 33.217 | 1 43.047 | 1 52.876 | 2 2.706 | 2 12.535 | 2 22.365 | 2 32.194 | 29 0.079 |
| 30 | 1 23.551 | 1 33.381 | 1 43.210 | 1 53.040 | 2 2.869 | 2 12.699 | 2 22.529 | 2 32.358 | 30 0.082 |
| 31 | 1 23.715 | 1 33.545 | 1 43.374 | 1 53.204 | 2 3.033 | 2 12.863 | 2 22.692 | 2 32.522 | 31 0.085 |
| 32 | 1 23.879 | 1 33.708 | 1 43.538 | 1 53.368 | 2 3.197 | 2 13.027 | 2 22.856 | 2 32.686 | 32 0.087 |
| 33 | 1 24.043 | 1 33.872 | 1 43.702 | 1 53.531 | 2 3.361 | 2 13.191 | 2 23.020 | 2 32.850 | 33 0.090 |
| 34 | 1 24.207 | 1 34.036 | 1 43.866 | 1 53.695 | 2 3.525 | 2 13.354 | 2 23.184 | 2 33.013 | 34 0.093 |
| 35 | 1 24.370 | 1 34.200 | 1 44.029 | 1 53.859 | 2 3.689 | 2 13.518 | 2 23.348 | 2 33.177 | 35 0.096 |
| 36 | 1 24.534 | 1 34.364 | 1 44.193 | 1 54.023 | 2 3.852 | 2 13.682 | 2 23.512 | 2 33.341 | 36 0.098 |
| 37 | 1 24.698 | 1 34.528 | 1 44.357 | 1 54.187 | 2 4.016 | 2 13.846 | 2 23.675 | 2 33.505 | 37 0.101 |
| 38 | 1 24.862 | 1 34.691 | 1 44.521 | 1 54.351 | 2 4.180 | 2 14.010 | 2 23.839 | 2 33.669 | 38 0.104 |
| 39 | 1 25.026 | 1 34.855 | 1 44.685 | 1 54.514 | 2 4.344 | 2 14.173 | 2 24.003 | 2 33.833 | 39 0.106 |
| 40 | 1 25.190 | 1 35.019 | 1 44.849 | 1 54.678 | 2 4.508 | 2 14.337 | 2 24.167 | 2 33.996 | 40 0.109 |
| 41 | 1 25.353 | 1 35.183 | 1 45.012 | 1 54.842 | 2 4.672 | 2 14.501 | 2 24.331 | 2 34.160 | 41 0.112 |
| 42 | 1 25.517 | 1 35.347 | 1 45.176 | 1 55.006 | 2 4.835 | 2 14.665 | 2 24.495 | 2 34.324 | 42 0.115 |
| 43 | 1 25.681 | 1 35.511 | 1 45.340 | 1 55.170 | 2 4.999 | 2 14.829 | 2 24.658 | 2 34.488 | 43 0.117 |
| 44 | 1 25.845 | 1 35.674 | 1 45.504 | 1 55.333 | 2 5.163 | 2 14.993 | 2 24.822 | 2 34.652 | 44 0.120 |
| 45 | 1 26.009 | 1 35.838 | 1 45.668 | 1 55.497 | 2 5.327 | 2 15.156 | 2 24.986 | 2 34.816 | 45 0.123 |
| 46 | 1 26.172 | 1 36.002 | 1 45.832 | 1 55.661 | 2 5.491 | 2 15.320 | 2 25.150 | 2 34.979 | 46 0.126 |
| 47 | 1 26.336 | 1 36.166 | 1 45.995 | 1 55.825 | 2 5.655 | 2 15.484 | 2 25.314 | 2 35.143 | 47 0.128 |
| 48 | 1 26.500 | 1 36.330 | 1 46.159 | 1 55.989 | 2 5.818 | 2 15.648 | 2 25.477 | 2 35.307 | 48 0.131 |
| 49 | 1 26.664 | 1 36.493 | 1 46.323 | 1 56.153 | 2 5.982 | 2 15.812 | 2 25.641 | 2 35.471 | 49 0.134 |
| 50 | 1 26.828 | 1 36.657 | 1 46.487 | 1 56.316 | 2 6.146 | 2 15.976 | 2 25.805 | 2 35.635 | 50 0.137 |
| 51 | 1 26.992 | 1 36.821 | 1 46.651 | 1 56.480 | 2 6.310 | 2 16.139 | 2 25.969 | 2 35.798 | 51 0.139 |
| 52 | 1 27.155 | 1 36.985 | 1 46.815 | 1 56.644 | 2 6.474 | 2 16.303 | 2 26.133 | 2 35.962 | 52 0.142 |
| 53 | 1 27.319 | 1 37.149 | 1 46.978 | 1 56.808 | 2 6.637 | 2 16.467 | 2 26.297 | 2 36.126 | 53 0.145 |
| 54 | 1 27.483 | 1 37.313 | 1 47.142 | 1 56.972 | 2 6.801 | 2 16.631 | 2 26.460 | 2 36.290 | 54 0.147 |
| 55 | 1 27.647 | 1 37.476 | 1 47.306 | 1 57.136 | 2 6.965 | 2 16.795 | 2 26.624 | 2 36.454 | 55 0.150 |
| 56 | 1 27.811 | 1 37.640 | 1 47.470 | 1 57.299 | 2 7.129 | 2 16.959 | 2 26.788 | 2 36.618 | 56 0.153 |
| 57 | 1 27.975 | 1 37.804 | 1 47.634 | 1 57.463 | 2 7.293 | 2 17.122 | 2 26.952 | 2 36.781 | 57 0.156 |
| 58 | 1 28.138 | 1 37.968 | 1 47.797 | 1 57.627 | 2 7.457 | 2 17.286 | 2 27.116 | 2 36.945 | 58 0.158 |
| 59 | 1 28.302 | 1 38.132 | 1 47.961 | 1 57.791 | 2 7.620 | 2 17.450 | 2 27.280 | 2 37.109 | 59 0.161 |
| Sidereal. | 8 ^h . | 9 ^h . | 10 ^h . | 11 ^h . | 12 ^h . | 13 ^h . | 14 ^h . | 15 ^h . | For Seconds. |

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

| TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL. | | | | | | | | | | |
|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------|-------|
| Sidereal. | 16 ^h . | 17 ^h . | 18 ^h . | 19 ^h . | 20 ^h . | 21 ^h . | 22 ^h . | 23 ^h . | For Seconds. | |
| m | m s | m s | m s | m s | m s | m s | m s | m s | s | s |
| 0 | 2 37.273 | 2 47.102 | 2 56.932 | 3 6.762 | 3 16.591 | 3 26.421 | 3 36.250 | 3 46.080 | 0 | 0.000 |
| 1 | 2 37.437 | 2 47.266 | 2 57.096 | 3 6.925 | 3 16.755 | 3 26.585 | 3 36.414 | 3 46.244 | 1 | 0.003 |
| 2 | 2 37.601 | 2 47.430 | 2 57.260 | 3 7.089 | 3 16.919 | 3 26.748 | 3 36.578 | 3 46.407 | 2 | 0.005 |
| 3 | 2 37.764 | 2 47.594 | 2 57.424 | 3 7.253 | 3 17.083 | 3 26.912 | 3 36.742 | 3 46.571 | 3 | 0.008 |
| 4 | 2 37.928 | 2 47.758 | 2 57.587 | 3 7.417 | 3 17.246 | 3 27.076 | 3 36.906 | 3 46.735 | 4 | 0.011 |
| 5 | 2 38.092 | 2 47.922 | 2 57.751 | 3 7.581 | 3 17.410 | 3 27.240 | 3 37.069 | 3 46.899 | 5 | 0.014 |
| 6 | 2 38.256 | 2 48.085 | 2 57.915 | 3 7.745 | 3 17.574 | 3 27.404 | 3 37.233 | 3 47.063 | 6 | 0.016 |
| 7 | 2 38.420 | 2 48.249 | 2 58.079 | 3 7.908 | 3 17.738 | 3 27.568 | 3 37.397 | 3 47.227 | 7 | 0.019 |
| 8 | 2 38.584 | 2 48.413 | 2 58.243 | 3 8.072 | 3 17.902 | 3 27.731 | 3 37.561 | 3 47.390 | 8 | 0.022 |
| 9 | 2 38.747 | 2 48.577 | 2 58.406 | 3 8.236 | 3 18.066 | 3 27.895 | 3 37.725 | 3 47.554 | 9 | 0.025 |
| 10 | 2 38.911 | 2 48.741 | 2 58.570 | 3 8.400 | 3 18.229 | 3 28.059 | 3 37.889 | 3 47.718 | 10 | 0.027 |
| 11 | 2 39.075 | 2 48.905 | 2 58.734 | 3 8.564 | 3 18.393 | 3 28.223 | 3 38.052 | 3 47.882 | 11 | 0.030 |
| 12 | 2 39.239 | 2 49.068 | 2 58.898 | 3 8.728 | 3 18.557 | 3 28.387 | 3 38.216 | 3 48.046 | 12 | 0.033 |
| 13 | 2 39.403 | 2 49.232 | 2 59.062 | 3 8.891 | 3 18.721 | 3 28.550 | 3 38.380 | 3 48.210 | 13 | 0.035 |
| 14 | 2 39.566 | 2 49.396 | 2 59.226 | 3 9.055 | 3 18.885 | 3 28.714 | 3 38.544 | 3 48.373 | 14 | 0.038 |
| 15 | 2 39.730 | 2 49.560 | 2 59.389 | 3 9.219 | 3 19.049 | 3 28.878 | 3 38.708 | 3 48.537 | 15 | 0.041 |
| 16 | 2 39.894 | 2 49.724 | 2 59.553 | 3 9.383 | 3 19.212 | 3 29.042 | 3 38.871 | 3 48.701 | 16 | 0.044 |
| 17 | 2 40.058 | 2 49.888 | 2 59.717 | 3 9.547 | 3 19.376 | 3 29.206 | 3 39.035 | 3 48.865 | 17 | 0.046 |
| 18 | 2 40.222 | 2 50.051 | 2 59.881 | 3 9.710 | 3 19.540 | 3 29.370 | 3 39.199 | 3 49.029 | 18 | 0.049 |
| 19 | 2 40.386 | 2 50.215 | 3 0.045 | 3 9.874 | 3 19.704 | 3 29.533 | 3 39.363 | 3 49.193 | 19 | 0.052 |
| 20 | 2 40.549 | 2 50.379 | 3 0.209 | 3 10.038 | 3 19.868 | 3 29.697 | 3 39.527 | 3 49.356 | 20 | 0.055 |
| 21 | 2 40.713 | 2 50.543 | 3 0.372 | 3 10.202 | 3 20.032 | 3 29.861 | 3 39.691 | 3 49.520 | 21 | 0.057 |
| 22 | 2 40.877 | 2 50.707 | 3 0.536 | 3 10.366 | 3 20.195 | 3 30.025 | 3 39.854 | 3 49.684 | 22 | 0.060 |
| 23 | 2 41.041 | 2 50.870 | 3 0.700 | 3 10.530 | 3 20.359 | 3 30.189 | 3 40.018 | 3 49.848 | 23 | 0.063 |
| 24 | 2 41.205 | 2 51.034 | 3 0.864 | 3 10.693 | 3 20.523 | 3 30.353 | 3 40.182 | 3 50.012 | 24 | 0.066 |
| 25 | 2 41.369 | 2 51.198 | 3 1.028 | 3 10.857 | 3 20.687 | 3 30.516 | 3 40.346 | 3 50.175 | 25 | 0.068 |
| 26 | 2 41.532 | 2 51.362 | 3 1.192 | 3 11.021 | 3 20.851 | 3 30.680 | 3 40.510 | 3 50.339 | 26 | 0.071 |
| 27 | 2 41.695 | 2 51.526 | 3 1.355 | 3 11.185 | 3 21.014 | 3 30.844 | 3 40.674 | 3 50.503 | 27 | 0.074 |
| 28 | 2 41.859 | 2 51.690 | 3 1.519 | 3 11.349 | 3 21.178 | 3 31.008 | 3 40.837 | 3 50.667 | 28 | 0.076 |
| 29 | 2 42.024 | 2 51.853 | 3 1.683 | 3 11.513 | 3 21.342 | 3 31.172 | 3 41.001 | 3 50.831 | 29 | 0.079 |
| 30 | 2 42.188 | 2 52.017 | 3 1.847 | 3 11.676 | 3 21.506 | 3 31.336 | 3 41.165 | 3 50.995 | 30 | 0.082 |
| 31 | 2 42.352 | 2 52.181 | 3 2.011 | 3 11.840 | 3 21.670 | 3 31.499 | 3 41.329 | 3 51.158 | 31 | 0.085 |
| 32 | 2 42.515 | 2 52.345 | 3 2.174 | 3 12.004 | 3 21.834 | 3 31.663 | 3 41.493 | 3 51.322 | 32 | 0.087 |
| 33 | 2 42.679 | 2 52.509 | 3 2.338 | 3 12.168 | 3 21.997 | 3 31.827 | 3 41.657 | 3 51.486 | 33 | 0.090 |
| 34 | 2 42.843 | 2 52.673 | 3 2.502 | 3 12.332 | 3 22.161 | 3 31.991 | 3 41.820 | 3 51.650 | 34 | 0.093 |
| 35 | 2 43.007 | 2 52.836 | 3 2.666 | 3 12.496 | 3 22.325 | 3 32.155 | 3 41.984 | 3 51.814 | 35 | 0.096 |
| 36 | 2 43.171 | 2 52.999 | 3 2.830 | 3 12.659 | 3 22.489 | 3 32.318 | 3 42.148 | 3 51.978 | 36 | 0.098 |
| 37 | 2 43.334 | 2 53.164 | 3 2.994 | 3 12.823 | 3 22.653 | 3 32.482 | 3 42.312 | 3 52.141 | 37 | 0.101 |
| 38 | 2 43.498 | 2 53.328 | 3 3.157 | 3 12.987 | 3 22.817 | 3 32.646 | 3 42.476 | 3 52.305 | 38 | 0.104 |
| 39 | 2 43.662 | 2 53.492 | 3 3.321 | 3 13.151 | 3 22.980 | 3 32.810 | 3 42.639 | 3 52.469 | 39 | 0.106 |
| 40 | 2 43.826 | 2 53.656 | 3 3.485 | 3 13.315 | 3 23.144 | 3 32.974 | 3 42.803 | 3 52.633 | 40 | 0.109 |
| 41 | 2 43.990 | 2 53.819 | 3 3.649 | 3 13.478 | 3 23.308 | 3 33.138 | 3 42.967 | 3 52.797 | 41 | 0.112 |
| 42 | 2 44.154 | 2 53.983 | 3 3.813 | 3 13.642 | 3 23.472 | 3 33.301 | 3 43.131 | 3 52.961 | 42 | 0.115 |
| 43 | 2 44.317 | 2 54.147 | 3 3.977 | 3 13.806 | 3 23.636 | 3 33.465 | 3 43.295 | 3 53.124 | 43 | 0.117 |
| 44 | 2 44.481 | 2 54.311 | 3 4.140 | 3 13.970 | 3 23.800 | 3 33.629 | 3 43.459 | 3 53.288 | 44 | 0.120 |
| 45 | 2 44.645 | 2 54.475 | 3 4.304 | 3 14.134 | 3 23.963 | 3 33.793 | 3 43.622 | 3 53.452 | 45 | 0.123 |
| 46 | 2 44.809 | 2 54.638 | 3 4.468 | 3 14.298 | 3 24.127 | 3 33.957 | 3 43.786 | 3 53.616 | 46 | 0.126 |
| 47 | 2 44.973 | 2 54.802 | 3 4.632 | 3 14.461 | 3 24.291 | 3 34.121 | 3 43.950 | 3 53.780 | 47 | 0.128 |
| 48 | 2 45.137 | 2 54.966 | 3 4.796 | 3 14.625 | 3 24.455 | 3 34.284 | 3 44.114 | 3 53.943 | 48 | 0.131 |
| 49 | 2 45.300 | 2 55.130 | 3 4.960 | 3 14.789 | 3 24.619 | 3 34.448 | 3 44.278 | 3 54.107 | 49 | 0.134 |
| 50 | 2 45.464 | 2 55.294 | 3 5.123 | 3 14.953 | 3 24.782 | 3 34.612 | 3 44.442 | 3 54.271 | 50 | 0.137 |
| 51 | 2 45.628 | 2 55.458 | 3 5.287 | 3 15.117 | 3 24.946 | 3 34.776 | 3 44.605 | 3 54.435 | 51 | 0.139 |
| 52 | 2 45.792 | 2 55.621 | 3 5.451 | 3 15.281 | 3 25.110 | 3 34.940 | 3 44.769 | 3 54.599 | 52 | 0.142 |
| 53 | 2 45.956 | 2 55.785 | 3 5.615 | 3 15.444 | 3 25.274 | 3 35.104 | 3 44.933 | 3 54.763 | 53 | 0.145 |
| 54 | 2 46.120 | 2 55.949 | 3 5.779 | 3 15.608 | 3 25.438 | 3 35.267 | 3 45.097 | 3 54.926 | 54 | 0.147 |
| 55 | 2 46.283 | 2 56.113 | 3 5.942 | 3 15.772 | 3 25.602 | 3 35.431 | 3 45.261 | 3 55.090 | 55 | 0.150 |
| 56 | 2 46.447 | 2 56.277 | 3 6.106 | 3 15.936 | 3 25.765 | 3 35.595 | 3 45.425 | 3 55.254 | 56 | 0.153 |
| 57 | 2 46.611 | 2 56.441 | 3 6.270 | 3 16.100 | 3 25.929 | 3 35.759 | 3 45.588 | 3 55.418 | 57 | 0.156 |
| 58 | 2 46.775 | 2 56.604 | 3 6.434 | 3 16.264 | 3 26.093 | 3 35.923 | 3 45.752 | 3 55.582 | 58 | 0.158 |
| 59 | 2 46.939 | 2 56.768 | 3 6.598 | 3 16.427 | 3 26.257 | 3 36.086 | 3 45.916 | 3 55.746 | 59 | 0.161 |
| Sidereal. | 16 ^h . | 17 ^h . | 18 ^h . | 19 ^h . | 20 ^h . | 21 ^h . | 22 ^h . | 23 ^h . | For Seconds. | |

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

| TO BE ADDED TO A MEAN TIME INTERVAL. | | | | | | | | | |
|--------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--------------|
| Mean Solar. | 0 ^h . | 1 ^h . | 2 ^h . | 3 ^h . | 4 ^h . | 5 ^h . | 6 ^h . | 7 ^h . | For Seconds. |
| m | m | m | m | m | m | m | m | m | s |
| 0 | 0 0.000 | 0 9.856 | 0 19.713 | 0 29.569 | 0 39.426 | 0 49.282 | 0 59.139 | 1 8.995 | 0 0.000 |
| 1 | 0 0.164 | 0 10.021 | 0 19.877 | 0 29.734 | 0 39.590 | 0 49.447 | 0 59.303 | 1 9.160 | 1 0.003 |
| 2 | 0 0.329 | 0 10.185 | 0 20.041 | 0 29.898 | 0 39.754 | 0 49.611 | 0 59.467 | 1 9.324 | 2 0.005 |
| 3 | 0 0.493 | 0 10.349 | 0 20.206 | 0 30.062 | 0 39.919 | 0 49.775 | 0 59.632 | 1 9.488 | 3 0.008 |
| 4 | 0 0.657 | 0 10.514 | 0 20.370 | 0 30.227 | 0 40.083 | 0 49.939 | 0 59.796 | 1 9.652 | 4 0.011 |
| 5 | 0 0.821 | 0 10.678 | 0 20.534 | 0 20.391 | 0 40.247 | 0 50.104 | 0 59.960 | 1 9.817 | 5 0.014 |
| 6 | 0 0.986 | 0 10.842 | 0 20.699 | 0 30.555 | 0 40.412 | 0 50.268 | 1 0.124 | 1 9.981 | 6 0.016 |
| 7 | 0 1.150 | 0 11.006 | 0 20.863 | 0 30.719 | 0 40.576 | 0 50.432 | 1 0.289 | 1 10.145 | 7 0.019 |
| 8 | 0 1.314 | 0 11.171 | 0 21.027 | 0 30.884 | 0 40.740 | 0 50.597 | 1 0.453 | 1 10.310 | 8 0.022 |
| 9 | 0 1.478 | 0 11.335 | 0 21.191 | 0 31.048 | 0 40.904 | 0 50.761 | 1 0.617 | 1 10.474 | 9 0.025 |
| 10 | 0 1.643 | 0 11.499 | 0 21.356 | 0 31.212 | 0 41.069 | 0 50.925 | 1 0.782 | 1 10.638 | 10 0.027 |
| 11 | 0 1.807 | 0 11.663 | 0 21.520 | 0 31.376 | 0 41.233 | 0 51.089 | 1 0.946 | 1 10.802 | 11 0.030 |
| 12 | 0 1.971 | 0 11.828 | 0 21.684 | 0 31.541 | 0 41.397 | 0 51.254 | 1 1.110 | 1 10.967 | 12 0.033 |
| 13 | 0 2.136 | 0 11.992 | 0 21.849 | 0 31.705 | 0 41.561 | 0 51.418 | 1 1.274 | 1 11.131 | 13 0.036 |
| 14 | 0 2.300 | 0 12.156 | 0 22.013 | 0 31.869 | 0 41.726 | 0 51.582 | 1 1.439 | 1 11.295 | 14 0.038 |
| 15 | 0 2.464 | 0 12.321 | 0 22.177 | 0 32.034 | 0 41.890 | 0 51.746 | 1 1.603 | 1 11.459 | 15 0.041 |
| 16 | 0 2.628 | 0 12.485 | 0 22.341 | 0 32.198 | 0 42.054 | 0 51.911 | 1 1.767 | 1 11.624 | 16 0.044 |
| 17 | 0 2.793 | 0 12.649 | 0 22.506 | 0 32.362 | 0 42.219 | 0 52.075 | 1 1.932 | 1 11.788 | 17 0.047 |
| 18 | 0 2.957 | 0 12.813 | 0 22.670 | 0 32.526 | 0 42.383 | 0 52.239 | 1 2.096 | 1 11.952 | 18 0.049 |
| 19 | 0 3.121 | 0 12.978 | 0 22.834 | 0 32.691 | 0 42.547 | 0 52.404 | 1 2.260 | 1 12.117 | 19 0.052 |
| 20 | 0 3.285 | 0 13.142 | 0 22.998 | 0 32.855 | 0 42.711 | 0 52.568 | 1 2.424 | 1 12.281 | 20 0.055 |
| 21 | 0 3.450 | 0 13.306 | 0 23.163 | 0 33.019 | 0 42.876 | 0 52.732 | 1 2.589 | 1 12.445 | 21 0.057 |
| 22 | 0 3.614 | 0 13.471 | 0 23.327 | 0 33.183 | 0 43.040 | 0 52.896 | 1 2.753 | 1 12.609 | 22 0.060 |
| 23 | 0 3.778 | 0 13.635 | 0 23.491 | 0 33.348 | 0 43.204 | 0 53.061 | 1 2.917 | 1 12.774 | 23 0.063 |
| 24 | 0 3.943 | 0 13.799 | 0 23.656 | 0 33.512 | 0 43.368 | 0 53.225 | 1 3.081 | 1 12.938 | 24 0.066 |
| 25 | 0 4.107 | 0 13.963 | 0 23.820 | 0 33.676 | 0 43.533 | 0 53.389 | 1 3.246 | 1 13.102 | 25 0.068 |
| 26 | 0 4.271 | 0 14.128 | 0 23.984 | 0 33.841 | 0 43.697 | 0 53.554 | 1 3.410 | 1 13.266 | 26 0.071 |
| 27 | 0 4.435 | 0 14.292 | 0 24.148 | 0 34.005 | 0 43.861 | 0 53.718 | 1 3.574 | 1 13.431 | 27 0.074 |
| 28 | 0 4.600 | 0 14.456 | 0 24.313 | 0 34.169 | 0 44.026 | 0 53.882 | 1 3.739 | 1 13.595 | 28 0.077 |
| 29 | 0 4.764 | 0 14.620 | 0 24.477 | 0 34.333 | 0 44.190 | 0 54.046 | 1 3.903 | 1 13.759 | 29 0.079 |
| 30 | 0 4.928 | 0 14.785 | 0 24.641 | 0 34.498 | 0 44.354 | 0 54.211 | 1 4.067 | 1 13.924 | 30 0.082 |
| 31 | 0 5.093 | 0 14.949 | 0 24.805 | 0 34.662 | 0 44.518 | 0 54.375 | 1 4.231 | 1 14.088 | 31 0.085 |
| 32 | 0 5.257 | 0 15.113 | 0 24.970 | 0 34.826 | 0 44.683 | 0 54.539 | 1 4.396 | 1 14.252 | 32 0.088 |
| 33 | 0 5.421 | 0 15.278 | 0 25.134 | 0 34.990 | 0 44.847 | 0 54.703 | 1 4.560 | 1 14.416 | 33 0.090 |
| 34 | 0 5.585 | 0 15.442 | 0 25.298 | 0 35.155 | 0 45.011 | 0 54.868 | 1 4.724 | 1 14.581 | 34 0.093 |
| 35 | 0 5.750 | 0 15.606 | 0 25.463 | 0 35.319 | 0 45.176 | 0 55.032 | 1 4.888 | 1 14.745 | 35 0.096 |
| 36 | 0 5.914 | 0 15.770 | 0 25.627 | 0 35.483 | 0 45.340 | 0 55.196 | 1 5.053 | 1 14.909 | 36 0.099 |
| 37 | 0 6.078 | 0 15.935 | 0 25.791 | 0 35.648 | 0 45.504 | 0 55.361 | 1 5.217 | 1 15.073 | 37 0.101 |
| 38 | 0 6.242 | 0 16.099 | 0 25.955 | 0 35.812 | 0 45.668 | 0 55.525 | 1 5.381 | 1 15.238 | 38 0.104 |
| 39 | 0 6.407 | 0 16.263 | 0 26.120 | 0 35.976 | 0 45.833 | 0 55.689 | 1 5.546 | 1 15.402 | 39 0.107 |
| 40 | 0 6.571 | 0 16.427 | 0 26.284 | 0 36.140 | 0 45.997 | 0 55.853 | 1 5.710 | 1 15.566 | 40 0.110 |
| 41 | 0 6.735 | 0 16.592 | 0 26.448 | 0 36.305 | 0 46.161 | 0 56.018 | 1 5.874 | 1 15.731 | 41 0.112 |
| 42 | 0 6.900 | 0 16.756 | 0 26.612 | 0 36.469 | 0 46.325 | 0 56.182 | 1 6.038 | 1 15.895 | 42 0.115 |
| 43 | 0 7.064 | 0 16.920 | 0 26.777 | 0 36.633 | 0 46.490 | 0 56.346 | 1 6.203 | 1 16.059 | 43 0.118 |
| 44 | 0 7.228 | 0 17.085 | 0 26.941 | 0 36.798 | 0 46.654 | 0 56.510 | 1 6.367 | 1 16.223 | 44 0.120 |
| 45 | 0 7.392 | 0 17.249 | 0 27.105 | 0 36.962 | 0 46.818 | 0 56.675 | 1 6.531 | 1 16.388 | 45 0.123 |
| 46 | 0 7.557 | 0 17.413 | 0 27.270 | 0 37.126 | 0 46.983 | 0 56.839 | 1 6.695 | 1 16.552 | 46 0.126 |
| 47 | 0 7.721 | 0 17.577 | 0 27.434 | 0 37.290 | 0 47.147 | 0 57.003 | 1 6.860 | 1 16.716 | 47 0.129 |
| 48 | 0 7.885 | 0 17.742 | 0 27.598 | 0 37.455 | 0 47.311 | 0 57.168 | 1 7.024 | 1 16.881 | 48 0.131 |
| 49 | 0 8.049 | 0 17.906 | 0 27.762 | 0 37.619 | 0 47.475 | 0 57.332 | 1 7.188 | 1 17.045 | 49 0.134 |
| 50 | 0 8.214 | 0 18.070 | 0 27.927 | 0 37.783 | 0 47.640 | 0 57.496 | 1 7.353 | 1 17.209 | 50 0.137 |
| 51 | 0 8.378 | 0 18.234 | 0 28.091 | 0 37.947 | 0 47.804 | 0 57.660 | 1 7.517 | 1 17.373 | 51 0.140 |
| 52 | 0 8.542 | 0 18.399 | 0 28.255 | 0 38.112 | 0 47.968 | 0 57.825 | 1 7.681 | 1 17.538 | 52 0.142 |
| 53 | 0 8.707 | 0 18.563 | 0 28.420 | 0 38.276 | 0 48.132 | 0 57.989 | 1 7.845 | 1 17.702 | 53 0.145 |
| 54 | 0 8.871 | 0 18.727 | 0 28.584 | 0 38.440 | 0 48.297 | 0 58.153 | 1 8.010 | 1 17.866 | 54 0.148 |
| 55 | 0 9.035 | 0 18.892 | 0 28.748 | 0 38.605 | 0 48.461 | 0 58.317 | 1 8.174 | 1 18.030 | 55 0.151 |
| 56 | 0 9.199 | 0 19.056 | 0 28.912 | 0 38.769 | 0 48.625 | 0 58.482 | 1 8.338 | 1 18.195 | 56 0.153 |
| 57 | 0 9.364 | 0 19.220 | 0 29.077 | 0 38.933 | 0 48.790 | 0 58.646 | 1 8.502 | 1 18.359 | 57 0.156 |
| 58 | 0 9.528 | 0 19.384 | 0 29.241 | 0 39.097 | 0 48.954 | 0 58.810 | 1 8.667 | 1 18.523 | 58 0.159 |
| 59 | 0 9.692 | 0 19.549 | 0 29.405 | 0 39.262 | 0 49.118 | 0 58.975 | 1 8.831 | 1 18.688 | 59 0.162 |
| Mean Solar. | 0 ^h . | 1 ^h . | 2 ^h . | 3 ^h . | 4 ^h . | 5 ^h . | 6 ^h . | 7 ^h . | For Seconds. |

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

| TO BE ADDED TO A MEAN TIME INTERVAL. | | | | | | | | | | |
|--------------------------------------|------------------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------|-------|
| Mean Solar. | 8 ^h . | 9 ^h . | 10 ^h . | 11 ^h . | 12 ^h . | 13 ^h . | 14 ^h . | 15 ^h . | For Seconds. | |
| 0 | 1 16.852 | 1 22.708 | 1 38.565 | 1 48.421 | 1 58.278 | 2 8.134 | 2 17.991 | 2 27.847 | 0 | 0.000 |
| 1 | 1 19.016 | 1 22.873 | 1 38.729 | 1 48.585 | 1 58.442 | 2 8.298 | 2 18.155 | 2 28.011 | 1 | 0.003 |
| 2 | 1 19.180 | 1 29.037 | 1 38.893 | 1 48.750 | 1 58.606 | 2 8.463 | 2 18.319 | 2 28.176 | 2 | 0.006 |
| 3 | 1 19.345 | 1 29.201 | 1 39.058 | 1 48.914 | 1 58.771 | 2 8.627 | 2 18.483 | 2 28.340 | 3 | 0.008 |
| 4 | 1 19.509 | 1 29.365 | 1 39.222 | 1 49.078 | 1 58.935 | 2 8.791 | 2 18.648 | 2 28.504 | 4 | 0.011 |
| 5 | 1 19.673 | 1 29.530 | 1 39.386 | 1 49.243 | 1 59.099 | 2 8.956 | 2 18.812 | 2 28.668 | 5 | 0.014 |
| 6 | 1 19.837 | 1 29.694 | 1 39.550 | 1 49.407 | 1 59.263 | 2 9.120 | 2 18.976 | 2 28.833 | 6 | 0.016 |
| 7 | 1 20.002 | 1 29.858 | 1 39.715 | 1 49.571 | 1 59.428 | 2 9.284 | 2 19.141 | 2 28.997 | 7 | 0.019 |
| 8 | 1 20.166 | 1 30.022 | 1 39.879 | 1 49.735 | 1 59.592 | 2 9.448 | 2 19.305 | 2 29.161 | 8 | 0.022 |
| 9 | 1 20.330 | 1 30.187 | 1 40.043 | 1 49.900 | 1 59.756 | 2 9.613 | 2 19.469 | 2 29.326 | 9 | 0.025 |
| 10 | 1 20.495 | 1 30.351 | 1 40.207 | 1 50.064 | 1 59.920 | 2 9.777 | 2 19.633 | 2 29.490 | 10 | 0.027 |
| 11 | 1 20.659 | 1 30.515 | 1 40.372 | 1 50.228 | 2 0.085 | 2 9.941 | 2 19.798 | 2 29.654 | 11 | 0.030 |
| 12 | 1 20.823 | 1 30.680 | 1 40.536 | 1 50.393 | 2 0.249 | 2 10.105 | 2 19.962 | 2 29.818 | 12 | 0.033 |
| 13 | 1 20.987 | 1 30.844 | 1 40.700 | 1 50.557 | 2 0.413 | 2 10.270 | 2 20.126 | 2 29.983 | 13 | 0.036 |
| 14 | 1 21.152 | 1 31.008 | 1 40.865 | 1 50.721 | 2 0.578 | 2 10.434 | 2 20.290 | 2 30.147 | 14 | 0.038 |
| 15 | 1 21.316 | 1 31.172 | 1 41.029 | 1 50.885 | 2 0.742 | 2 10.598 | 2 20.455 | 2 30.311 | 15 | 0.041 |
| 16 | 1 21.480 | 1 31.337 | 1 41.193 | 1 51.050 | 2 0.906 | 2 10.763 | 2 20.619 | 2 30.476 | 16 | 0.044 |
| 17 | 1 21.644 | 1 31.501 | 1 41.357 | 1 51.214 | 2 1.070 | 2 10.927 | 2 20.783 | 2 30.640 | 17 | 0.047 |
| 18 | 1 21.809 | 1 31.665 | 1 41.522 | 1 51.378 | 2 1.235 | 2 11.091 | 2 20.948 | 2 30.804 | 18 | 0.049 |
| 19 | 1 21.973 | 1 31.829 | 1 41.686 | 1 51.542 | 2 1.399 | 2 11.255 | 2 21.112 | 2 30.968 | 19 | 0.052 |
| 20 | 1 22.137 | 1 31.994 | 1 41.850 | 1 51.707 | 2 1.563 | 2 11.420 | 2 21.276 | 2 31.133 | 20 | 0.055 |
| 21 | 1 22.302 | 1 32.158 | 1 42.015 | 1 51.871 | 2 1.727 | 2 11.584 | 2 21.440 | 2 31.297 | 21 | 0.057 |
| 22 | 1 22.466 | 1 32.322 | 1 42.179 | 1 52.035 | 2 1.892 | 2 11.748 | 2 21.605 | 2 31.461 | 22 | 0.060 |
| 23 | 1 22.630 | 1 32.487 | 1 42.343 | 1 52.200 | 2 2.056 | 2 11.912 | 2 21.769 | 2 31.625 | 23 | 0.063 |
| 24 | 1 22.794 | 1 32.651 | 1 42.507 | 1 52.364 | 2 2.220 | 2 12.077 | 2 21.933 | 2 31.790 | 24 | 0.066 |
| 25 | 1 22.959 | 1 32.815 | 1 42.672 | 1 52.528 | 2 2.385 | 2 12.241 | 2 22.098 | 2 31.954 | 25 | 0.068 |
| 26 | 1 23.123 | 1 32.979 | 1 42.836 | 1 52.692 | 2 2.549 | 2 12.405 | 2 22.262 | 2 32.118 | 26 | 0.071 |
| 27 | 1 23.287 | 1 33.144 | 1 43.000 | 1 52.857 | 2 2.713 | 2 12.570 | 2 22.426 | 2 32.283 | 27 | 0.074 |
| 28 | 1 23.451 | 1 33.308 | 1 43.164 | 1 53.021 | 2 2.877 | 2 12.734 | 2 22.590 | 2 32.447 | 28 | 0.077 |
| 29 | 1 23.616 | 1 33.472 | 1 43.329 | 1 53.185 | 2 3.042 | 2 12.898 | 2 22.755 | 2 32.611 | 29 | 0.079 |
| 30 | 1 23.780 | 1 33.637 | 1 43.493 | 1 53.349 | 2 3.206 | 2 13.062 | 2 22.919 | 2 32.775 | 30 | 0.082 |
| 31 | 1 23.944 | 1 33.801 | 1 43.657 | 1 53.514 | 2 3.370 | 2 13.227 | 2 23.083 | 2 32.940 | 31 | 0.085 |
| 32 | 1 24.109 | 1 33.965 | 1 43.822 | 1 53.678 | 2 3.534 | 2 13.391 | 2 23.247 | 2 33.104 | 32 | 0.088 |
| 33 | 1 24.273 | 1 34.129 | 1 43.986 | 1 53.842 | 2 3.699 | 2 13.555 | 2 23.412 | 2 33.268 | 33 | 0.090 |
| 34 | 1 24.437 | 1 34.294 | 1 44.150 | 1 54.007 | 2 3.863 | 2 13.720 | 2 23.576 | 2 33.432 | 34 | 0.093 |
| 35 | 1 24.601 | 1 34.458 | 1 44.314 | 1 54.171 | 2 4.027 | 2 13.884 | 2 23.740 | 2 33.597 | 35 | 0.096 |
| 36 | 1 24.766 | 1 34.622 | 1 44.479 | 1 54.335 | 2 4.192 | 2 14.048 | 2 23.905 | 2 33.761 | 36 | 0.099 |
| 37 | 1 24.930 | 1 34.786 | 1 44.643 | 1 54.499 | 2 4.356 | 2 14.212 | 2 24.069 | 2 33.925 | 37 | 0.101 |
| 38 | 1 25.094 | 1 34.951 | 1 44.807 | 1 54.664 | 2 4.520 | 2 14.377 | 2 24.233 | 2 34.090 | 38 | 0.104 |
| 39 | 1 25.259 | 1 35.115 | 1 44.971 | 1 54.828 | 2 4.684 | 2 14.541 | 2 24.397 | 2 34.254 | 39 | 0.107 |
| 40 | 1 25.423 | 1 35.279 | 1 45.136 | 1 54.992 | 2 4.849 | 2 14.705 | 2 24.562 | 2 34.418 | 40 | 0.110 |
| 41 | 1 25.587 | 1 35.444 | 1 45.300 | 1 55.156 | 2 5.013 | 2 14.869 | 2 24.726 | 2 34.582 | 41 | 0.112 |
| 42 | 1 25.751 | 1 35.608 | 1 45.464 | 1 55.321 | 2 5.177 | 2 15.034 | 2 24.890 | 2 34.747 | 42 | 0.115 |
| 43 | 1 25.916 | 1 35.772 | 1 45.629 | 1 55.485 | 2 5.342 | 2 15.198 | 2 25.054 | 2 34.911 | 43 | 0.118 |
| 44 | 1 26.080 | 1 35.936 | 1 45.793 | 1 55.649 | 2 5.506 | 2 15.362 | 2 25.219 | 2 35.075 | 44 | 0.120 |
| 45 | 1 26.244 | 1 36.101 | 1 45.957 | 1 55.814 | 2 5.670 | 2 15.527 | 2 25.383 | 2 35.239 | 45 | 0.123 |
| 46 | 1 26.408 | 1 36.265 | 1 46.121 | 1 55.978 | 2 5.834 | 2 15.691 | 2 25.547 | 2 35.404 | 46 | 0.126 |
| 47 | 1 26.573 | 1 36.429 | 1 46.286 | 1 56.142 | 2 5.999 | 2 15.855 | 2 25.712 | 2 35.568 | 47 | 0.129 |
| 48 | 1 26.737 | 1 36.593 | 1 46.450 | 1 56.306 | 2 6.163 | 2 16.019 | 2 25.876 | 2 35.732 | 48 | 0.131 |
| 49 | 1 26.901 | 1 36.758 | 1 46.614 | 1 56.471 | 2 6.327 | 2 16.184 | 2 26.040 | 2 35.897 | 49 | 0.134 |
| 50 | 1 27.066 | 1 36.922 | 1 46.778 | 1 56.635 | 2 6.491 | 2 16.348 | 2 26.204 | 2 36.061 | 50 | 0.137 |
| 51 | 1 27.230 | 1 37.086 | 1 46.943 | 1 56.799 | 2 6.656 | 2 16.512 | 2 26.369 | 2 36.225 | 51 | 0.140 |
| 52 | 1 27.394 | 1 37.251 | 1 47.107 | 1 56.964 | 2 6.820 | 2 16.676 | 2 26.533 | 2 36.389 | 52 | 0.142 |
| 53 | 1 27.558 | 1 37.415 | 1 47.271 | 1 57.128 | 2 6.984 | 2 16.841 | 2 26.697 | 2 36.553 | 53 | 0.145 |
| 54 | 1 27.723 | 1 37.579 | 1 47.436 | 1 57.292 | 2 7.149 | 2 17.005 | 2 26.861 | 2 36.718 | 54 | 0.148 |
| 55 | 1 27.887 | 1 37.743 | 1 47.600 | 1 57.456 | 2 7.313 | 2 17.169 | 2 27.026 | 2 36.882 | 55 | 0.151 |
| 56 | 1 28.051 | 1 37.908 | 1 47.764 | 1 57.621 | 2 7.477 | 2 17.334 | 2 27.190 | 2 37.047 | 56 | 0.153 |
| 57 | 1 28.215 | 1 38.072 | 1 47.928 | 1 57.785 | 2 7.641 | 2 17.498 | 2 27.354 | 2 37.211 | 57 | 0.156 |
| 58 | 1 28.380 | 1 38.236 | 1 48.093 | 1 57.949 | 2 7.806 | 2 17.662 | 2 27.519 | 2 37.375 | 58 | 0.159 |
| 59 | 1 28.544 | 1 38.400 | 1 48.257 | 1 58.113 | 2 7.970 | 2 17.826 | 2 27.683 | 2 37.539 | 59 | 0.162 |
| Mean Solar. | 8 ^h . | 9 ^h . | 10 ^h . | 11 ^h . | 12 ^h . | 13 ^h . | 14 ^h . | 15 ^h . | For Seconds. | |

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

| TO BE ADDED TO A MEAN TIME INTERVAL. | | | | | | | | | |
|--------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------|
| Mean Solar. | 16 ^h . | 17 ^h . | 18 ^h . | 19 ^h . | 20 ^h . | 21 ^h . | 22 ^h . | 23 ^h . | For Seconds. |
| m | m | m | m | m | m | m | m | m | s |
| 0 | 2 37.704 | 2 47.560 | 2 57.417 | 3 7.273 | 3 17.129 | 3 26.986 | 3 36.842 | 3 46.699 | 0 0.000 |
| 1 | 2 37.868 | 2 47.724 | 2 57.581 | 3 7.437 | 3 17.294 | 3 27.150 | 3 37.007 | 3 46.863 | 1 0.003 |
| 2 | 2 38.032 | 2 47.889 | 2 57.745 | 3 7.602 | 3 17.458 | 3 27.315 | 3 37.171 | 3 47.027 | 2 0.005 |
| 3 | 2 38.196 | 2 48.053 | 2 57.909 | 3 7.766 | 3 17.622 | 3 27.479 | 3 37.335 | 3 47.192 | 3 0.008 |
| 4 | 2 38.361 | 2 48.217 | 2 58.074 | 3 7.930 | 3 17.787 | 3 27.643 | 3 37.500 | 3 47.356 | 4 0.011 |
| 5 | 2 38.525 | 2 48.381 | 2 58.238 | 3 8.094 | 3 17.951 | 3 27.807 | 3 37.664 | 3 47.520 | 5 0.014 |
| 6 | 2 38.689 | 2 48.546 | 2 58.402 | 3 8.259 | 3 18.115 | 3 27.972 | 3 37.828 | 3 47.685 | 6 0.016 |
| 7 | 2 38.854 | 2 48.710 | 2 58.566 | 3 8.423 | 3 18.279 | 3 28.136 | 3 37.992 | 3 47.849 | 7 0.019 |
| 8 | 2 39.018 | 2 48.874 | 2 58.731 | 3 8.587 | 3 18.444 | 3 28.300 | 3 38.157 | 3 48.013 | 8 0.022 |
| 9 | 2 39.182 | 2 49.039 | 2 58.895 | 3 8.751 | 3 18.608 | 3 28.464 | 3 38.321 | 3 48.177 | 9 0.025 |
| 10 | 2 39.346 | 2 49.203 | 2 59.059 | 3 8.916 | 3 18.772 | 3 28.629 | 3 38.485 | 3 48.342 | 10 0.027 |
| 11 | 2 39.511 | 2 49.367 | 2 59.224 | 3 9.080 | 3 18.937 | 3 28.793 | 3 38.649 | 3 48.506 | 11 0.030 |
| 12 | 2 39.675 | 2 49.531 | 2 59.388 | 3 9.244 | 3 19.101 | 3 28.957 | 3 38.814 | 3 48.670 | 12 0.033 |
| 13 | 2 39.839 | 2 49.696 | 2 59.552 | 3 9.409 | 3 19.265 | 3 29.122 | 3 38.978 | 3 48.834 | 13 0.036 |
| 14 | 2 40.003 | 2 49.860 | 2 59.716 | 3 9.573 | 3 19.429 | 3 29.286 | 3 39.142 | 3 48.999 | 14 0.038 |
| 15 | 2 40.168 | 2 50.024 | 2 59.881 | 3 9.737 | 3 19.594 | 3 29.450 | 3 39.307 | 3 49.163 | 15 0.041 |
| 16 | 2 40.332 | 2 50.188 | 3 0.045 | 3 9.901 | 3 19.758 | 3 29.614 | 3 39.471 | 3 49.327 | 16 0.044 |
| 17 | 2 40.496 | 2 50.353 | 3 0.209 | 3 10.066 | 3 19.923 | 3 29.779 | 3 39.635 | 3 49.492 | 17 0.047 |
| 18 | 2 40.661 | 2 50.517 | 3 0.373 | 3 10.230 | 3 20.086 | 3 29.943 | 3 39.799 | 3 49.656 | 18 0.049 |
| 19 | 2 40.825 | 2 50.681 | 3 0.538 | 3 10.394 | 3 20.251 | 3 30.107 | 3 39.964 | 3 49.820 | 19 0.052 |
| 20 | 2 40.989 | 2 50.846 | 3 0.702 | 3 10.559 | 3 20.415 | 3 30.271 | 3 40.128 | 3 49.984 | 20 0.055 |
| 21 | 2 41.153 | 2 51.010 | 3 0.866 | 3 10.723 | 3 20.579 | 3 30.436 | 3 40.292 | 3 50.149 | 21 0.057 |
| 22 | 2 41.318 | 2 51.174 | 3 1.031 | 3 10.887 | 3 20.744 | 3 30.600 | 3 40.456 | 3 50.313 | 22 0.060 |
| 23 | 2 41.482 | 2 51.338 | 3 1.195 | 3 11.051 | 3 20.908 | 3 30.764 | 3 40.621 | 3 50.477 | 23 0.063 |
| 24 | 2 41.646 | 2 51.503 | 3 1.359 | 3 11.216 | 3 21.072 | 3 30.929 | 3 40.785 | 3 50.642 | 24 0.066 |
| 25 | 2 41.810 | 2 51.667 | 3 1.523 | 3 11.380 | 3 21.236 | 3 31.093 | 3 40.949 | 3 50.806 | 25 0.068 |
| 26 | 2 41.975 | 2 51.831 | 3 1.688 | 3 11.544 | 3 21.401 | 3 31.257 | 3 41.114 | 3 50.970 | 26 0.071 |
| 27 | 2 42.139 | 2 51.995 | 3 1.852 | 3 11.708 | 3 21.565 | 3 31.421 | 3 41.278 | 3 51.134 | 27 0.074 |
| 28 | 2 42.303 | 2 52.160 | 3 2.016 | 3 11.873 | 3 21.729 | 3 31.586 | 3 41.442 | 3 51.299 | 28 0.077 |
| 29 | 2 42.468 | 2 52.324 | 3 2.181 | 3 12.037 | 3 21.893 | 3 31.750 | 3 41.606 | 3 51.463 | 29 0.079 |
| 30 | 2 42.632 | 2 52.488 | 3 2.345 | 3 12.201 | 3 22.058 | 3 31.914 | 3 41.771 | 3 51.627 | 30 0.082 |
| 31 | 2 42.796 | 2 52.653 | 3 2.509 | 3 12.366 | 3 22.222 | 3 32.078 | 3 41.935 | 3 51.791 | 31 0.085 |
| 32 | 2 42.960 | 2 52.817 | 3 2.673 | 3 12.530 | 3 22.386 | 3 32.243 | 3 42.099 | 3 51.956 | 32 0.088 |
| 33 | 2 43.125 | 2 52.981 | 3 2.838 | 3 12.694 | 3 22.551 | 3 32.407 | 3 42.264 | 3 52.120 | 33 0.090 |
| 34 | 2 43.289 | 2 53.145 | 3 3.002 | 3 12.858 | 3 22.715 | 3 32.571 | 3 42.428 | 3 52.284 | 34 0.093 |
| 35 | 2 43.453 | 2 53.310 | 3 3.166 | 3 13.023 | 3 22.879 | 3 32.736 | 3 42.592 | 3 52.449 | 35 0.096 |
| 36 | 2 43.617 | 2 53.474 | 3 3.330 | 3 13.187 | 3 23.043 | 3 32.900 | 3 42.756 | 3 52.613 | 36 0.099 |
| 37 | 2 43.782 | 2 53.638 | 3 3.495 | 3 13.351 | 3 23.208 | 3 33.064 | 3 42.921 | 3 52.777 | 37 0.101 |
| 38 | 2 43.946 | 2 53.803 | 3 3.659 | 3 13.515 | 3 23.372 | 3 33.228 | 3 43.085 | 3 52.941 | 38 0.104 |
| 39 | 2 44.110 | 2 53.967 | 3 3.823 | 3 13.680 | 3 23.536 | 3 33.393 | 3 43.249 | 3 53.106 | 39 0.107 |
| 40 | 2 44.275 | 2 54.131 | 3 3.988 | 3 13.844 | 3 23.700 | 3 33.557 | 3 43.413 | 3 53.270 | 40 0.110 |
| 41 | 2 44.439 | 2 54.295 | 3 4.152 | 3 14.008 | 3 23.865 | 3 33.721 | 3 43.578 | 3 53.434 | 41 0.112 |
| 42 | 2 44.603 | 2 54.460 | 3 4.316 | 3 14.173 | 3 24.029 | 3 33.886 | 3 43.742 | 3 53.598 | 42 0.115 |
| 43 | 2 44.767 | 2 54.624 | 3 4.480 | 3 14.337 | 3 24.193 | 3 34.050 | 3 43.906 | 3 53.763 | 43 0.118 |
| 44 | 2 44.932 | 2 54.788 | 3 4.645 | 3 14.501 | 3 24.358 | 3 34.214 | 3 44.071 | 3 53.927 | 44 0.120 |
| 45 | 2 45.096 | 2 54.952 | 3 4.809 | 3 14.665 | 3 24.522 | 3 34.378 | 3 44.235 | 3 54.091 | 45 0.123 |
| 46 | 2 45.260 | 2 55.117 | 3 4.973 | 3 14.830 | 3 24.686 | 3 34.543 | 3 44.399 | 3 54.256 | 46 0.126 |
| 47 | 2 45.425 | 2 55.281 | 3 5.137 | 3 14.994 | 3 24.850 | 3 34.707 | 3 44.563 | 3 54.420 | 47 0.129 |
| 48 | 2 45.589 | 2 55.445 | 3 5.302 | 3 15.158 | 3 25.015 | 3 34.871 | 3 44.728 | 3 54.584 | 48 0.131 |
| 49 | 2 45.753 | 2 55.610 | 3 5.466 | 3 15.322 | 3 25.179 | 3 35.035 | 3 44.892 | 3 54.748 | 49 0.134 |
| 50 | 2 45.917 | 2 55.774 | 3 5.630 | 3 15.487 | 3 25.343 | 3 35.200 | 3 45.056 | 3 54.913 | 50 0.137 |
| 51 | 2 46.082 | 2 55.938 | 3 5.795 | 3 15.651 | 3 25.508 | 3 35.364 | 3 45.220 | 3 55.077 | 51 0.140 |
| 52 | 2 46.246 | 2 56.102 | 3 5.959 | 3 15.815 | 3 25.672 | 3 35.528 | 3 45.385 | 3 55.241 | 52 0.142 |
| 53 | 2 46.410 | 2 56.267 | 3 6.123 | 3 15.980 | 3 25.836 | 3 35.693 | 3 45.549 | 3 55.405 | 53 0.145 |
| 54 | 2 46.574 | 2 56.431 | 3 6.287 | 3 16.144 | 3 26.000 | 3 35.857 | 3 45.713 | 3 55.570 | 54 0.148 |
| 55 | 2 46.739 | 2 56.595 | 3 6.452 | 3 16.308 | 3 26.165 | 3 36.021 | 3 45.878 | 3 55.734 | 55 0.151 |
| 56 | 2 46.903 | 2 56.759 | 3 6.616 | 3 16.472 | 3 26.329 | 3 36.185 | 3 46.042 | 3 55.898 | 56 0.153 |
| 57 | 2 47.067 | 2 56.924 | 3 6.780 | 3 16.637 | 3 26.493 | 3 36.350 | 3 46.206 | 3 56.063 | 57 0.156 |
| 58 | 2 47.232 | 2 57.088 | 3 6.944 | 3 16.801 | 3 26.657 | 3 36.514 | 3 46.370 | 3 56.227 | 58 0.159 |
| 59 | 2 47.396 | 2 57.252 | 3 7.109 | 3 16.965 | 3 26.822 | 3 36.678 | 3 46.535 | 3 56.391 | 59 0.162 |
| Mean Solar. | 16 ^h . | 17 ^h . | 18 ^h . | 19 ^h . | 20 ^h . | 21 ^h . | 22 ^h . | 23 ^h . | For Seconds. |

TABLE IV.—LATITUDE BY POLARIS.

TABLE FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to local sidereal time.

If the sidereal time is $\left\{ \begin{array}{l} \text{less than } 1^h 18^m.9, \text{ subtract it from } 1^h 18^m.9; \\ \text{between } 1^h 18^m.9. \text{ and } 13^h 18^m.9, \text{ subtract } 1^h 18^m.9 \text{ from it;} \\ \text{greater than } 13^h 18^m.9, \text{ subtract it from } 25^h 18^m.9; \end{array} \right.$

and the remainder is the hour-angle of Polaris.

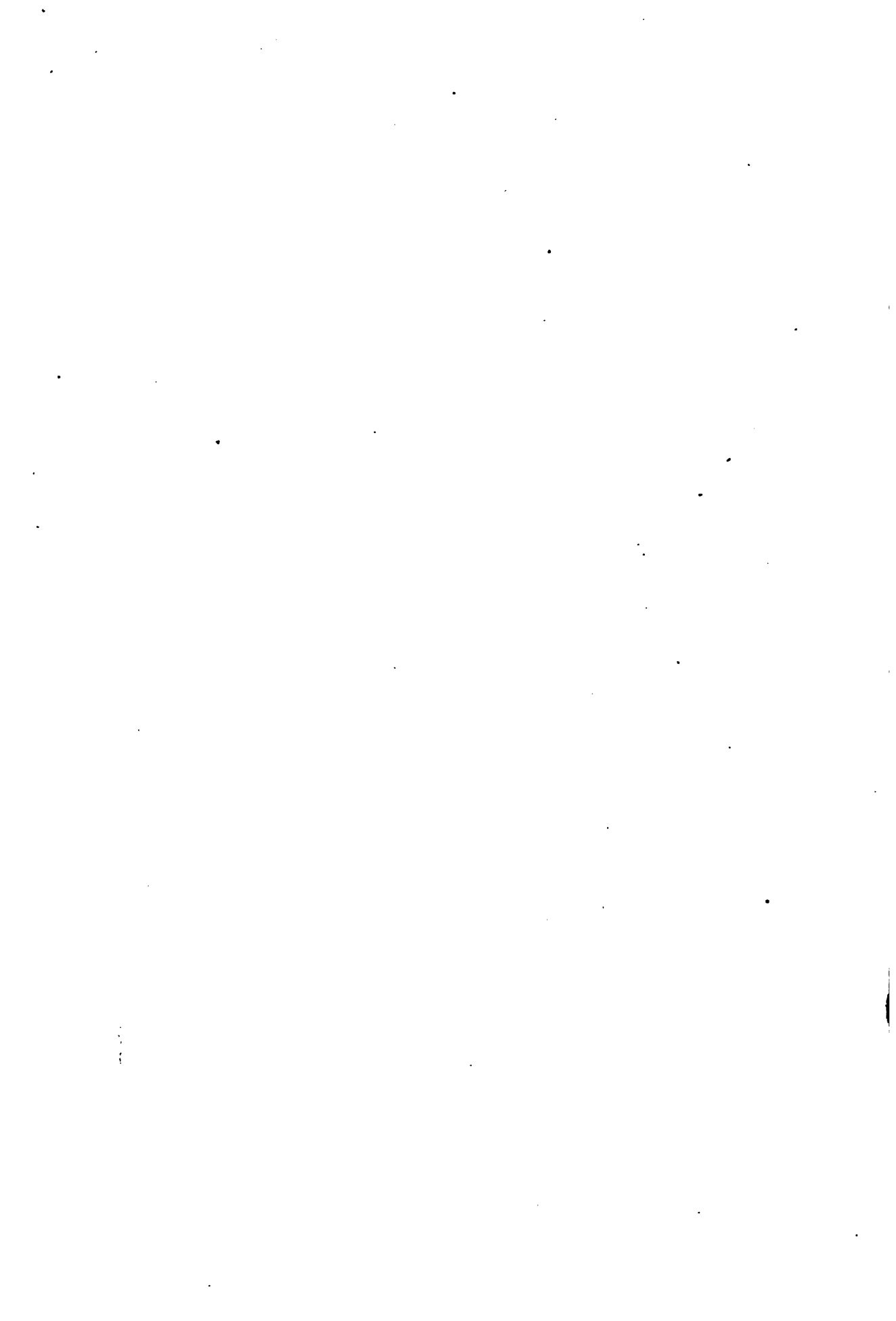
With this hour-angle take out the correction from Table IV (below), and add it to or subtract it from the true altitude, according to its sign. The result is the latitude of the place.

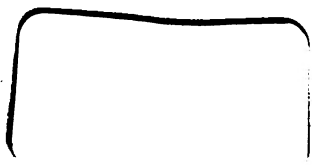
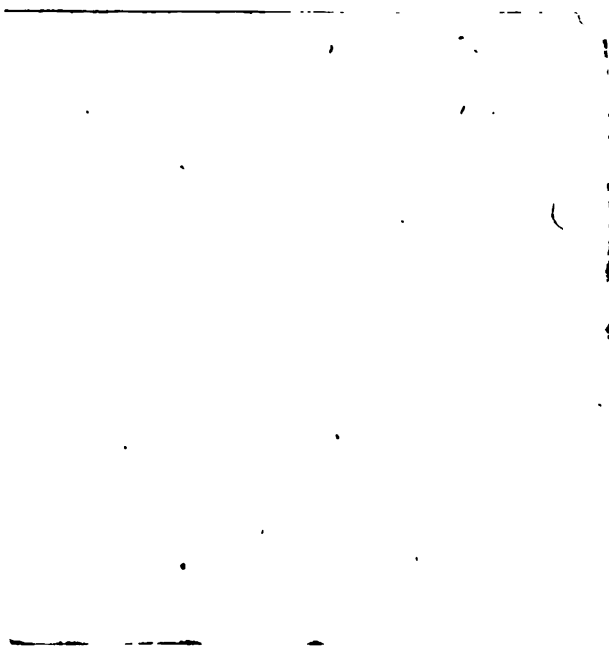
Example.—1891, November 10, at $9^h 29^m 29^s$, P. M., mean solar time, in longitude 29° east of Greenwich, suppose the true altitude of Polaris to be $29^\circ 29'$: required the latitude of the place.

| | |
|--|--------------------|
| Local astronomical mean time | $9^h 29^m 29^s$ |
| Reduction from Table III, for $9^h 29^m 29^s$ | + 1 34 |
| Greenwich sidereal time of mean noon, November 10, page 183 | 15 17 25.8 |
| Reduction from Table III, for longitude ($= 1^h 56^m$ east, or minus) | — 0 19 |
| Sum (having regard to signs) is equal to local sidereal time | $0^h 48^m 9.8^s$ |
| Subtract sidereal time | $1^h 18^m 54^s$ |
| Remainder is equal to hour-angle of Polaris | $0^h 30^m 44.2^s$ |
| True altitude | + $29^\circ 29'$ |
| Correction from Table IV. | — 1 16.3 |
| Approximate Latitude | + $28^\circ 12.7'$ |

TABLE IV.—1891.

| Hour-Angle. | 0 ^h . | 1 ^h . | 2 ^h . | 3 ^h . | 4 ^h . | 5 ^h . |
|-------------|------------------|------------------|------------------|------------------|-------------------|-------------------|
| m | | | | | | |
| 0 | — 1 17.0 | — 1 14.3 | — 1 6.5 | — 0 54.1 | — 0 37.8 | — 0 19.1 |
| 5 | 1 17.0 0.0 | 1 13.8 0.5 | 1 5.6 0.9 | 0 52.9 1.3 | 0 36.3 1.5 | 0 17.5 1.6 |
| 10 | 1 16.9 0.1 | 1 13.3 0.5 | 1 4.7 0.9 | 0 51.6 1.3 | 0 34.8 1.5 | 0 15.8 1.7 |
| 15 | 1 16.8 0.1 | 1 12.8 0.6 | 1 3.8 0.9 | 0 50.3 1.3 | 0 33.3 1.5 | 0 14.2 1.7 |
| 20 | — 1 16.7 0.2 | — 1 12.2 0.6 | — 1 2.8 1.0 | — 0 49.0 1.3 | — 0 31.8 1.5 | — 0 12.5 1.6 |
| 25 | 1 16.5 0.2 | 1 11.6 0.6 | 1 1.8 1.0 | 0 47.7 1.3 | 0 30.3 1.5 | 0 10.9 1.7 |
| 30 | 1 16.3 0.2 | 1 11.0 0.6 | 1 0.8 1.0 | 0 46.4 1.3 | 0 28.8 1.5 | 0 9.2 1.7 |
| 35 | 1 16.1 0.2 | 1 10.3 0.7 | 0 59.7 1.1 | 0 45.0 1.4 | 0 27.2 1.6 | 0 7.6 1.6 |
| 40 | — 1 15.8 0.3 | — 1 9.6 0.7 | — 0 58.6 1.1 | — 0 43.6 1.4 | — 0 25.6 1.6 | — 0 5.9 1.7 |
| 45 | 1 15.5 0.3 | 1 8.9 0.7 | 0 57.5 1.1 | 0 42.2 1.4 | 0 24.0 1.6 | 0 4.2 1.7 |
| 50 | 1 15.1 0.4 | 1 8.1 0.8 | 0 56.4 1.1 | 0 40.8 1.4 | 0 22.4 1.6 | 0 2.5 1.7 |
| 55 | 1 14.7 0.4 | 1 7.3 0.8 | 0 55.3 1.1 | 0 39.3 1.5 | 0 20.8 1.6 | — 0 0.8 1.7 |
| 60 | — 1 14.3 0.4 | — 1 6.5 0.8 | — 0 54.1 1.2 | — 0 37.8 1.5 | — 0 19.1 1.7 | + 0 0.9 1.7 |
| Hour-Angle. | 6 ^h . | 7 ^h . | 8 ^h . | 9 ^h . | 10 ^h . | 11 ^h . |
| m | | | | | | |
| 0 | + 0 0.9 | + 0 20.7 | + 0 39.1 | + 0 54.9 | + 1 6.9 | + 1 14.4 |
| 5 | 0 2.6 1.7 | 0 22.3 1.6 | 0 40.5 1.4 | 0 56.0 1.1 | 1 7.7 0.8 | 1 14.8 0.4 |
| 10 | 0 4.3 1.7 | 0 23.9 1.6 | 0 41.9 1.4 | 0 57.1 1.1 | 1 8.5 0.8 | 1 15.2 0.4 |
| 15 | 0 6.0 1.7 | 0 25.5 1.6 | 0 43.3 1.4 | 0 58.2 1.1 | 1 9.2 0.7 | 1 15.6 0.4 |
| 20 | + 0 7.6 1.6 | + 0 27.1 1.6 | + 0 44.7 1.4 | + 0 59.3 1.1 | + 1 9.9 0.7 | + 1 15.9 0.3 |
| 25 | 0 9.3 1.7 | 0 28.7 1.6 | 0 46.1 1.4 | 1 0.4 1.0 | 1 10.6 0.7 | 1 16.2 0.3 |
| 30 | 0 11.0 1.7 | 0 30.3 1.6 | 0 47.4 1.3 | 1 1.4 1.0 | 1 11.2 0.6 | 1 16.4 0.3 |
| 35 | 0 12.6 1.6 | 0 31.8 1.5 | 0 48.7 1.3 | 1 2.4 1.0 | 1 11.8 0.6 | 1 16.6 0.3 |
| 40 | + 0 14.2 1.6 | + 0 33.3 1.5 | + 0 50.0 1.3 | + 1 3.4 1.0 | + 1 12.4 0.6 | + 1 16.7 0.3 |
| 45 | 0 15.9 1.7 | 0 34.8 1.5 | 0 51.3 1.3 | 1 4.3 0.9 | 1 12.9 0.5 | 1 16.8 0.3 |
| 50 | 0 17.5 1.6 | 0 36.3 1.5 | 0 52.5 1.2 | 1 5.2 0.9 | 1 13.4 0.5 | 1 16.9 0.3 |
| 55 | 0 19.1 1.6 | 0 37.7 1.4 | 0 53.7 1.2 | 1 6.1 0.9 | 1 13.9 0.5 | 1 17.0 0.3 |
| 60 | + 0 20.7 1.6 | + 0 39.1 1.4 | + 0 54.9 1.2 | + 1 6.9 0.8 | + 1 14.4 0.5 | + 1 17.0 0.3 |





3 2044

